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COMPUTERWORLD

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DBMS: It's Lotus's turn at bat

Broad-based server strategy, Gupta alliance to counter Microsoft lineup

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. is preparing to go toe-to-toe with rival Microsoft Corp. by hatching an ambitious data base plan emphasizing front-end tools that are portable to an array of data base management systems.

After months of not commenting, Lotus is set today to acknowledge a 2-year-old co-development agreement with Gupta Technologies, Inc., Lotus sources said.

Lotus is also scheduled to provide more details on its plans for Lotus/DBMS, a line of server-oriented products intended to provide networked data base functions and access to a broad range of minicomputer- and mainframe-based DBMSs, the sources said.

Divide and conquer
Lotus and Gupta Technologies will split up responsibilities for selling Lotus/DBMS



CW CHART: FRANK C. O'CONNELL

So close and yet so far

Today's announcement by Lotus comes just six weeks after Microsoft, Ashton-Tate Corp. and Sybase, Inc. announced SQL Server, another server-based DBMS. Despite remarkable similarities in core engine technology, the Microsoft and Lotus strategies could not be farther apart in other respects.

Microsoft aims to establish a single standard for an SQL serv-

Continued on page 8

Sun's 386 peeks over PC horizon

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. will reveal in early April its long-awaited 80386-based microcomputer, able to run both Microsoft Corp.'s MS-DOS and Sun's Unix-based SunOS operating system, according to sources at Sun.

The system, code-named Roadrunner, will be available in two versions, offering 20- and 25-MHz clock speeds, those sources said. A basic configuration will offer 8M bytes of random-access memory, expandable to 32M bytes.

Entry-level pricing for the Sun 386 will be set at about $8,000, sources said.

Sun Chairman and Chief Executive Officer Scott McNealy declined to comment on the system.

Phoenix Technologies Ltd., sources said, provided Sun with a software coprocessor, allowing DOS sessions to be run under Unix through a combination of board-level hardware as well as software. It enables workstations with incompatible operating systems like Unix to

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Amdahl, NAS expect to unravel new MVS

BY JAMES CONNOLLY
and J. A. SAVAGE
CW STAFF

Officials of Amdahl Corp. and National Advanced Systems last week said they will deliver whatever hardware enhancements are necessary to support IBM's new MVS/ESA operating system within a year of the first deliveries of the software. IBM has said it will begin MVS/ESA deliveries to its own customers — which include Amdahl and NAS — in August.

IBM has placed a burden on the shoulders of its plug-compatible manufacturer competition with the announcement of MVS/ESA [CW, Feb. 22]. But PCMs said that supporting IBM's newest operating system will be a relatively minor challenge.

Furthermore, the Amdahl and NAS officials and other observers emphasized that many of the hardware and software modifications for MVS/ESA and products like it can be made using publicly available IBM documents. Little reverse-engineering is required, they said.

NAS's director of market planning, Carl V. Claunch, said NAS and its hardware supplier, Hitachi Ltd., expect to have to

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EDS outgrows Mr. Goodwrench role

BY ELISABETH HORWITT
CW STAFF

After three years of heavy labor trying to get General Motors Corp.'s information processing house in order, Electronic Data Systems Corp. is refocusing its sights on commercial systems integration — just when that market may be set to explode.

The company has a good chance of making a killing, industry analysts claim. But first, it needs to prove it has outgrown its dependence on GM business as well as its older role as a traditional, all-or-nothing systems integrator.

A realistic goal for EDS is to have 50% or more of its business coming from outside GM by 1990, according to Donald Atwood, GM's vice-chairman, who is responsible for all of



GM's Donald Atwood

GM's technical staffs and subsidiaries, including EDS and GM-Hughes Electronics.

That is a significant turnaround, considering that in 1986, 73% of EDS's revenue came from GM and the company's identity as an independent systems integrator seemed to be in danger of getting swallowed up in its role as GM's MIS department.

Just prior to the 1984 takeover, EDS was a 15,000-employee, $1 billion company with strong user bases in the government, retail, banking and insurance sectors. By 1986, the company had 40,000 employees — about 10,000 of them former GM MIS people — and

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Pipeline. Siemens trumpets the arrival of Cornet, an ISDN Primary Rate Interface for its Saturn PBX line that includes D channel messaging formats. Page 14.

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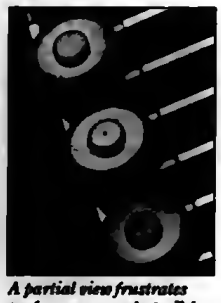
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ED THOMPSON
AMDAHL CORP.

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Clone of contention?

Kaypro first to promise Micro Channel system

BY DOUGLAS BARNEY
CW STAFF

SOLANA BEACH, Calif. — Braving legions of lawyers and IBM threats to protect its proprietary technology, Kaypro Corp. has become the first microcomputer vendor to reveal definite plans to clone the IBM Personal System/2 Micro Channel architecture.

Kaypro, once a leader in the CP/M market, has been only moderately successful in the IBM-compatible world. It hopes a successful PS/2-compatible product will help it regain some of its former luster in the corporate marketplace.

Kaypro plans to ship the system by the end of May, according to David Kay, the company's president. Kay declined to provide the source of chip sets and BIOS technology or give product configuration information.

Although the technical hurdles in cloning the PS/2 have been nearly overcome by firms such as Phoenix Technologies Ltd., Chips and Technologies, Inc. and Western Digital Corp., clone manufacturers have been so fearful of lawsuits that few have publicly discussed plans.

Legal action taken

IBM has trumpeted its intention to aggressively protect its proprietary technology and has even filed suit against AST Research, Inc. and Orchid Technology, Inc. for using the PS/2 name in advertisements. Both suits have been settled.

Kay is apparently not worried about a lawsuit. "We are confident . . . in regard to licensing the intellectual property of the players involved in the Micro Channel technology," he said.

A full PS/2 compatible may be necessary to effectively run such strategic IBM software as OS/2 Extended Edition, which includes proprietary data base and communications facilities.

DEC readies Polar Star for Super Tuesday debut

BY STANLEY GIBSON
CW STAFF

Digital Equipment Corp. has chosen Super Tuesday to announce its long-awaited mainframe-class multiprocessor, code-named Polar Star, according to a consensus of analysts and industry observers.

A DEC spokesman confirmed that an announcement is scheduled to take place at DEC's Marlboro, Mass., facility March 8 but declined to elaborate.

Polar Star, which will consist of four tightly coupled VAX 8700 systems, will be capable of up to 22 million instructions per second [CW, Dec. 14, 1987], according to previous statements by a company executive.

The system will offer symmetrical, or peer, multiprocessing, compared with the master-slave multiprocessing relationship used in Vaxclusters, DEC said. A new version of the VMS operating system, Version 5, will reportedly be required for the multiprocessing capability.

Running route

Stephen Widen, a DEC analyst at International Data Corp. (IDC) in Framingham, Mass., said that despite earlier predictions, DEC may not announce Version 5 of VMS when Polar Star is announced.

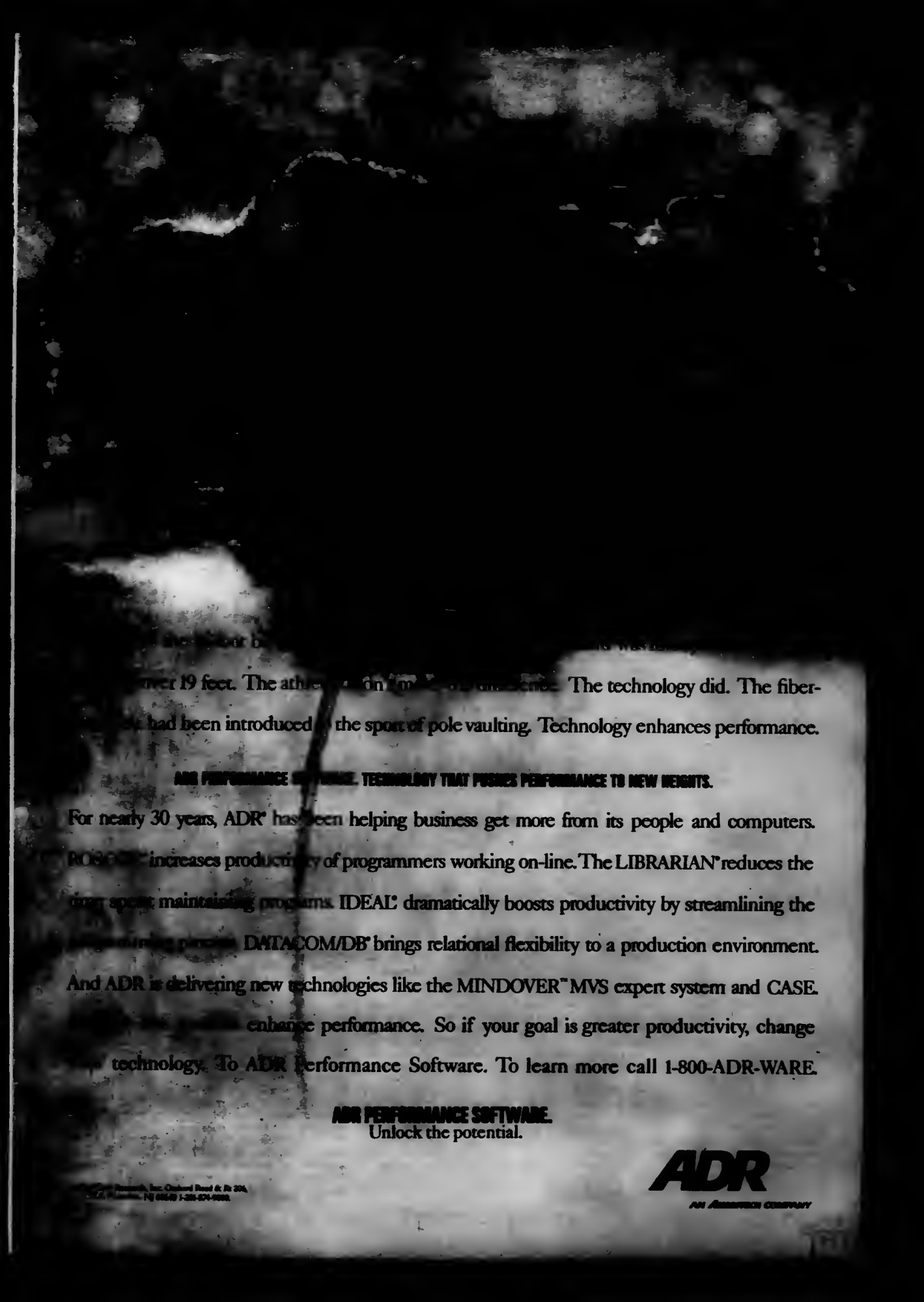
The operating system features necessary to do multiprocessing would have to be included in the Polar Star announcement, he said, but a full-fledged Version 5 might not be ready at that time.

Analysts said that in addition to Polar Star, DEC might unveil the following:

- A smaller multiprocessing system, code-named Calypso. While it could be announced as soon as March 8, it more likely will be announced in the following two months, according to one source. The system reportedly will contain up to four CMOS-based Microvax III processors.
- An RA 90 disk drive, a 9-in. storage device with a 1.2G-byte capacity. This product could be announced as soon as March 8 but more probably within the next two months.
- As part of a major move into transaction processing, a cooperative agreement with at least one firm specializing in vertical-market transaction processing software.

Polar Star and Calypso will perform multiprocessing, as opposed to parallel processing, IDC's Widen said. The multiprocessors will not be able to divide a program into several parts for simultaneous execution, as is the case with parallel processing.

However, a Polar Star or Calypso multiprocessor could be partitioned into up to four CPUs running different operating systems, Widen said.



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Sidekick upgrade finally ready

BY STEPHEN JONES
CW STAFF

SCOTTS VALLEY, Calif. — The long-awaited upgrade to Borland International's Sidekick desktop management program should materialize from the vapor base this week after nearly three years of development.



Borland's Sidekick upgrade *offers multiple users on a network a common calendar*

Sidekick Plus is a souped up version of the widely used random-access-memory-resident desktop organizer that Borland first shipped in 1984. The utility program is set to sell for $199.95, compared with the $84.95 cost of the original Sidekick.

Borland claimed that the utility can be squeezed into as few as 70K bytes of random-access memory, but the firm said that can only be accomplished by swapping pieces of the RAM-resident program back and forth to a hard disk.

One beta-test user contacted last week said that the swapping procedure drains the product's performance.

Sidekick Plus, scheduled to ship in the first half of March, features nine file-editor notepads that can hold up to 11,000 words each and can be viewed on the screen at one time, a data communications package, four improved calculators and a multiwindowed outliner.

Among other things . . .

An updated calendaring system provides common calendars that can be accessed and modified by a number of users whenever it is running on a local-area network.

It can also be programmed to automatically place a telephone call at a given date and time, with an alarm to signal the user.

The program runs on Microsoft Corp. MS-DOS-based personal computers and under IBM's OS/2 Standard Edition 1.0 in compatibility mode.

Not really late

Borland has been telling users for the last two years that a Sidekick upgrade was on the way, but nothing had emerged until last week.

Philippe Kahn, president of Borland, maintained that the product is not late but that rather "it had been talked about for a long time."

Kahn is looking to leverage an installed base of about two million Sidekick users for upgrade sales while pitching the revamp to corporate America as a companion utility to such Borland products as Quattro and Sprint.

However, the developer might have trouble winning over any user running OS/2, because that operating system all but eliminates the use of RAM-resident programs — including Sidekick Plus.

Paper saver

Still, the program's ability to organize schedules, directories and myriad pieces of loose paper appeals to many users.

"I don't even use a paper pad anymore because of it; I don't know what I'd do without it," said a project manager with a Fortune 500 electronics company who has beta-tested the program for the last three months.

Borland will continue to market Sidekick as a beginner's alternative to the advanced Sidekick Plus upgrade.

AT&T answers SNA's call with console, Tandem deal

BY JEAN S. BOZMAN
CW STAFF

LISLE, Ill. — AT&T Network Systems moved on two fronts last week to counter the pull of IBM's closed Systems Network Architecture at large corporate sites. AT&T announced a console that gives large corporate customers control of their Centrex and Integrated Services Digital Network (ISDN) lines as well as a look into IBM's Netview running on their IBM mainframes.

In a surprise move, AT&T executives also announced an agreement to jointly develop transaction processing applications with Tandem Computers, Inc. in Cupertino, Calif.

The nonexclusive agreement between AT&T and Tandem would make the Tandem-run software available to ISDN users through AT&T's 5 ESS, or Electronic Switching System, and the public packet-switched network. As the first outside vendor to design applications for the 5 ESS-switched ISDN service, Tandem reportedly will develop industry-specific software.

The vertical markets have yet to be defined, said Gerald Peterson, vice-president of marketing for Tandem. He did not set a firm time for product availability but said AT&T agreed to aid in market research, to certify the Tandem software's 5 ESS interface and to make sure it conforms to ISDN standards.

Threat to IBM

Dale Kutnick, executive vice-president of Gartner Securities, Inc., said he believes the alliance could represent a threat to IBM because "it could end up that Tandem's processors will handle some of the applications that traditionally have been run on an IBM mainframe."



Tandem's Peterson

Industry analyst Fred Chanowski, president of Chanowski Telecommunications Management Corp. in Needham, Mass., said the AT&T moves provide users with greater network control.

"The customer now literally owns an element in the network," he said. He also said the inclusion of an interface to Netview indicates that AT&T recognizes "that IBM is the dominant player in data communications and that they have to work with them."

IBM backs off fee for moved gear

BY STANLEY GIBSON
CW STAFF

In response to objections from computer dealers and lessors, IBM announced Friday that it is changing its Maintenance Agreement Acceptability Letter (MAAL) policy, which was announced last fall.

The policy required that a fee be paid in order to recertify equipment for IBM maintenance after it had been moved by someone other than IBM. The company last week said it will not charge that fee as long as certain provisions are met.

The MAAL requirement had the potential of raising customer prices and reducing a user's equipment moving and reconfiguration options, according to leasing companies.

The measure was scheduled to become effective Dec. 1 of last year, but was postponed pending the results of negotiations between IBM and the Computer Dealers and Lessors Association (CDLA). The change announced last week is the result of those talks. Ambrose Carr, director of industry relations at IBM, said the policy will not be enforced by IBM as long as proper packing equipment and an audit trail of equipment changes are in place.

'Got out of line'

Every IBM machine is supplied with special covers and brackets for moving, and IBM will insist that such equipment be used, Carr said. The MAAL policy was established because the cost of replacing parts to recertify a piece of equipment under IBM's maintenance agreement "really got out of line," Carr said.

The CDLA announced recently that members of its organization found to be swapping older parts for newer ones in equipment being moved will be recommended for expulsion from the group.

"The industry recognized the problem, and the CDLA felt the MAAL was an administrative and cost burden," Carr said.

Although the MAAL policy is still on the books, it will not be implemented pending the success of preventive measures, Carr said.

After May 1 — the effective date of the new policy — if there is no audit trail, if the correct packing materials are not being used and if IBM has to replace parts to put the equipment back under its maintenance agreement, then IBM will charge for the parts replacement, Carr said.

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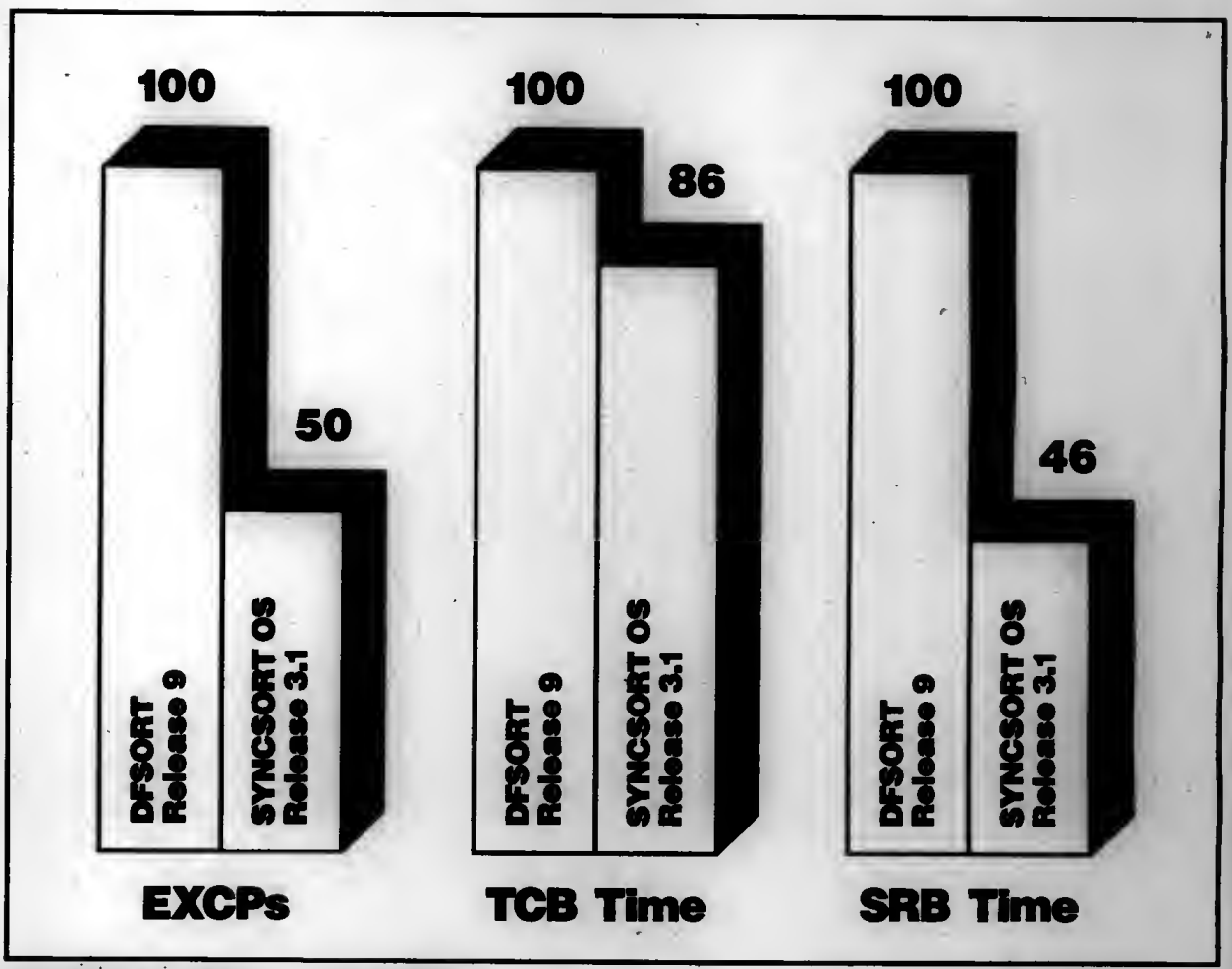
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Demand high to extend SAA umbrella further

BY CHARLES BABCOCK
CW STAFF

ANALYSIS

At the Common users group conference in Chicago last October, IBM System/34, 36 and 38 customers wore buttons with the letters SAA crossed out in red.

The mid-range users were upset that IBM's Systems Application Architecture made no mention of RPG, the programming language in which System/34, 36 and 38 applications are written. IBM officials responded quickly to the demonstrators.

"Clearly their intent is to support RPG III under SAA. That was publicly stated a number of times," said Charles Massoglia, an East Lansing, Mich., System/36 and 38 consultant who attended the conference.

John T. Friedline, IBM's Atlanta-based marketing manager for SAA, said, "We would like to add more languages to SAA. RPG is one of them."

Party preparations

The outspokeness of the IBM mid-range system users and IBM's accommodating stance illustrate one of the dilemmas that is shaping up for SAA as it nears its first birthday.

With customers beginning to take SAA seriously, they want to see the IBM products on which they depend included under its umbrella. When SAA extends its reach, however, the task of achieving application portability grows larger.

"The more IBM adds to SAA, the more difficult it becomes to accomplish its original goals," said Dennis J. Yablonsky, chief executive officer of the Carnegie Group, Inc. in Pittsburgh.

"If IBM were to willy-nilly include everything that people ask for in SAA, then the object of portability would never be achieved," agreed Paul Hessinger, chief technical officer of Computer Task Group, Inc. in Buffalo, N.Y. But Hessinger said he is convinced additions will be made on a controlled basis.

So far, the only additions to SAA have been CICS/MVS and IMS/VS. IBM added the two mainframe teleprocessing monitors last October, in part to assuage the concerns of the 25,000 CICS user sites and 3,200 IMS/DC sites.

The mainframe language PL/I is a likely addition, Friedline said in an interview with *Computerworld*. Many large shops have developed applications in that language, and IBM's expert system shell Knowledgetool is written in it.

Friedline said IBM has a strict review process that determines what is added to SAA:

- First, diverse elements of IBM must agree that a need exists for the component to be added.
- The reviewers must agree on a standard architecture to govern the form in which the component will be added.
- IBM must fund development of the component for each of the four operating systems covered by SAA — that is, MVS in its latest version; ESA/370 and VM on mainframes; an unnamed mid-range operating system, possibly that found on the still unannounced Silverlake; and OS/2 Extended Edition for the Personal System/2.
- Finally, a product must exist under one of the operating systems before its inclusion under SAA so that IBM has something real to point to with the announcement, Friedline said.

Not reassured

These standards do not necessarily reassure mid-range users. One of them, Dan Cense, a listener in Friedline's The Yankee Group audience and manager of international marketing systems at Polaroid Corp. in Cambridge, Mass., said what he saw in SAA was a plan to tie IBM mainframe and personal computer environments closer together.

Cense said he saw little reference to mid-range machines, although he is willing to wait and see what Silverlake looks like. Silverlake is the unannounced but widely anticipated IBM follow-on to the System/36 and 38. Cense's firm is unusual in that it uses both mainframes and System/36s. Although IBM is committed to providing SAA software on a future mid-range platform, Cense said, he does not know what that platform will be nor how soon it will arrive. His main question is whether his existing RPG II applications will run on it.

The programming languages chosen so far for SAA have little relevance to his 14 System/36 shops, Cense noted. Cobol is barely used in them, and C and Fortran are nonexistent. At the same time, Cense said adding RPG to PCs and mainframes is a low priority for IBM because it is almost nonexistent on those machines today.

"There is an enormous cost to support different operating systems in the mid-range," Cense noted.

"What they were basically telling us was the mainframe user won't need a departmental machine. He can tie his mainframe as a server to PCs or PC local-area networks," he said.

Deal fulfills Ungermann dream

BY KATHY CHIN LEONG
CW STAFF

SANTA CLARA, Calif. — Like many Silicon Valley entrepreneurs, Ralph Ungermann often dreamed that his networking company would one day become a billion-dollar business. Now, after a $260 million buy-out by Tandem Computers, Inc., it looks like Ungermann-Bass, Inc. will get there faster than expected, Ungermann said last week.

In an interview with *Computerworld*, Ungermann painted a picture of the opportunities the company will gain as a result of the acquisition, particularly in on-line transaction processing.

He also said the deal lifts the cloud of uncertainty that has hung over operations since the company snubbed a $175 million acquisition bid by Digital Communications Associates, Inc. (DCA) in November 1987. "In the past six months . . . I spent more time selling our viability than selling our product," Ungerman said.

I got a name

Ungermann-Bass will become a wholly owned subsidiary of Tandem and will retain its name, with Ungermann remaining president of the subsidiary.

Although he is a vice-president and board member of Tandem, Ungermann said the best contribution he can make to that



Ralph Ungermann

firm is to successfully lead his company. "I don't even think I will have an office at Tandem," he noted.

Seizing a larger market share in Tandem's popular industry segments is a natural outcome of the deal, Ungermann said.

Tandem's customers fall into three key areas: telecommunications, financial and manufacturing. More than 50% of Ungermann-Bass customers are in the manufacturing market, with less than 20% in telecommunications and still less in the financial community. "All of Tandem's users are going to need networks, and now we can be there to catch them," Ungermann said. No reorganization plan is on the drawing board at Ungermann-Bass.

Some analysts tracking the market gave the move a firm thumbs-up. "There is a continuing need to be big enough to slug it out with IBM and DEC," said Tom White, president of Infonetics, Inc. "This is exactly what they have done."

Ungermann-Bass will inevitably lose its identity, White said. "IBM said Rolm would maintain its independence, and now we see IBM's label on their equipment," he said. "In two years, the Ungermann-Bass label will be gone."

Immediate chemistry

In late December, when Ungermann met with Tandem founder and President Jim Treybig to see if Tandem would resell Ungermann-Bass gear, the talks grew serious: Both wound up exploring the possibility of a merger. Tandem had an low-end networking strategy at the time, and potential customers would then look to IBM or Digital Equipment Corp. Ungermann-Bass was limited in its service and support resources.

Although Tandem has had no formal ties with Ungermann-Bass in the past, the two firms found themselves jointly selling products in overlapping markets, particularly the manufacturing arena. Last year, they won a Hughes Aircraft Co. bid together.

"It would take us five years on our own" to build a bigger support organization, Ungermann said. "Now it will take a few months."

MIS warm on mainframes, Unix, study says

BY NELL MARGOLIS
CW STAFF

BOSTON — Rekindled interest in mainframes and an unexpected enthusiasm for Unix were among the surprising themes sounded by MIS directors considering mid-range purchase decisions, according to a recent report by The Yankee Group.

The market research firm surveyed more than 300 large-company MIS chiefs to gauge their perceptions of and opinions on major mid-range computer manufacturers and wares and found that mainframes are high on MIS acquisition lists.

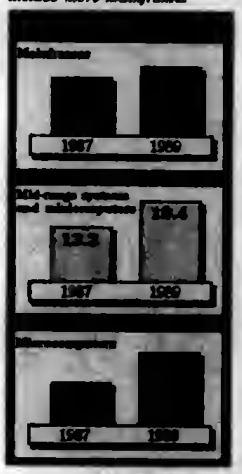
John Logan, The Yankee Group's director of mid-range systems, said his firm now estimates the mainframe market will grow by more than 10% in the next two years, up from a 4% projection reported by a similar survey group last year.

The startling resurgence of interest in the mainframe market, Logan said, foreshadows "the starting of the squeeze of the mid-range market."

Anticipating the shipment of IBM products, MIS managers who are running out of computer capacity are finding "a reason to wait for the mainframe," Logan said.

Shopping list

MIS directors' buying plans include more mainframes



INFORMATION PROVIDED BY THE YANKEE GROUP
CW CHART

Even more startling than the vote of confidence for mainframes was an enthusiastic response to Unix-based mid-range systems.

Only 36% of survey respondents said they will not evaluate any of the many offerings in the low-priced, apparently powerful Unix-based machine category; 64% said they would.

Rave reviews for DEC

In less surprising news, Digital Equipment Corp. emerged as the leader of the pack, substantially outscoring all other vendors in the product line category, narrowly squeezing out IBM in the applications leadership category and also copping the gold medal as "most favored vendor to work with."

IBM made an overall strong second-place showing in the survey, with its 4300 line outdistancing its System/38, 9370 and System/36, in that order, in popularity.

In an upset victory in the product line category, IBM's 4300 line was bumped down to third place by Tandem Computers, Inc.'s Nonstop, lauded for its on-line transaction processing capability.

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Lotus takes Notes to PC forum

BY ED SCANNELL
CW STAFF

NAPLES, Fla. — Lotus Development Corp. last week previewed its first work group package that allows users to send textual and graphics information across networks to plan meetings and track projects.

Code-named Notes, the program allows users to call up a document from a central data base, add comments to it and track it from user to user. The program's security features permit only selected people to see it.

Lotus has not determined a price for the product, which will be available in about a year, according to Jim Manzi, Lotus's president and chief executive officer, who previewed the product here at the Personal Computing Forum.

Lotus claims the product will make workers more productive once they do meet or may eliminate lower level meetings altogether.

"The bottom line is that a whole layer of intermediaries and information filters and routers disappear from the process, and decision makers are connected more directly to key pieces of information," Manzi said. Users can view the information in several ways: by chronology, name, category or the person performing the evaluation, Manzi said. The program borrows some concepts from Agenda, Lotus's yet-to-be-released personal information manager, but has some important differences, according to Manzi.



Notes *features document tracking functions*

"Some might think Notes is Agenda for group work. That's not correct, but it's not totally wrong, either," Manzi said.

Both Notes and Agenda were developed as part of the chairman's research and development team, a group of in-house Lotus developers and alumni put together by company founder Mitch Kapor. Notes is the first product released by that group.

"You can still assume we need two separate products. Given the state of technology at the time, we assumed DOS was what we had," said Kapor, who also attended the forum last week.

Notes was designed to work with IBM's OS/2 Standard Edition 1.0, OS/2 Extended Edition and Presentation Manager.

Notes is now being beta-tested by several large accounts as well as by almost 200 users within Lotus, Manzi said.

DBMS

FROM PAGE 1

er product and is actively inviting third parties to provide front ends and OEMs to bundle the system with hardware, analysts said.

So far, Lotus is going it alone. Unlike Microsoft, which has announced its intent to run under OS/2 only, Lotus/DBMS and its related tools will run on a variety of hardware and software platforms. Lotus/DBMS will run on a single workstation that will be available under OS/2 only, according to an analyst recently briefed by Lotus, but the firm is also expected to offer a server product that will run on either Microsoft MS-DOS or OS/2-based servers.

Lotus, which announced its planned entry into the data base market nearly a year ago, declined to comment.

Lotus and Gupta will split marketing responsibilities, with Lotus focusing on end-user tools and Gupta providing programmers with development tools. Gupta is providing Lotus with an SQL-based DBMS engine that will run under both MS-DOS and OS/2 and offering router technology for workstation access to a server data base, another source briefed by Lotus said.

The Gupta product already runs under MS-DOS but can address up to 16M bytes of memory by using a special C compiler. Microsoft, which licensed similar technology from Sybase, is only going after the OS/2 market, although MS-DOS machines can communicate with the server. Despite these differences, the two combatants will overlap at the center. "They are going head-to-head with Microsoft, with architecture that is strikingly similar," the analyst said.

Interface dependent

The delivery of the SQL-based Lotus/DBMS product line is highly dependent on Microsoft's shipping the OS/2 Presentation Manager interface, currently slated for October. Lotus 1-2-3/G, a graphical version of 1-2-3, will require the Presentation Manager and is expected to be the single most important front-end tool for Lotus/DBMS.

While Microsoft is working on an unspecified set of front-end tools, the firm's main focus is on popularizing the engine and establishing it as a component of systems software, the analyst said.

Lotus, on the other hand, is focusing more of its attention on end-user oriented front-end tools than on the data base itself and will make those tools available for non-Lotus data base products. Regardless, Lotus is expected to push the Gupta DBMS as the primary engine.

"Lotus's emphasis is as an applications house. Microsoft is a systems house and turned over most of the end-user stuff to others," the analyst said.

Lotus also has a heavy focus on connections to host systems. "They are doing drivers to different data bases, such as DB2," said the other source briefed by Lotus. Unlike the Gupta support of peer-to-peer communications, Lotus's plans concentrate on uploading and downloading data rather than updating host data bases in real time. Gupta will be responsible for providing LU6.2 for cooperative processing and production-oriented data base applications. The current product can work with active IBM DB2 files and is being enhanced to tie into other data bases.

Although Lotus is focusing almost exclusively on end-user tools, systems programmers will be able to write directly to Lotus/DBMS on the server using tools from Gupta.

The Lotus tools will provide ad hoc queries and forms generation. "The goal is to have where the data resides be inviable to the users, allowing them to do ad hoc queries into other data bases," the analyst said.

These tools will be linked together with a new programming language called Lotus Extended Application Facility (LEAF), which the firm is developing specifically for Lotus applications. "LEAF is the glue that holds the Lotus tools together," said another source briefed by Lotus.

LAN Manager APIs get Novell OK; IBM treads water

BY PATRICIA KEEFE
CW STAFF

PROVO, Utah — Novell, Inc. last week announced support for a critical piece of Microsoft Corp.'s approach to OS/2 networking — key LAN Manager application programming interfaces (API).

Novell, which initially spurned the Microsoft approach, sees the APIs as akin to IBM's Netbios and a separate issue from the LAN Manager. This support means users of Novell's network operating system, Netware, can be assured of running most, if not all, OS/2 applications.

There is speculation, which Novell denies, that customer pressure forced the firm to knuckle under to Microsoft. "Interesting, the way they've turned around," said Rob Glaser, Microsoft's manager of networking products.

Banyan Systems, Inc., another network software competitor, and IBM, in a reversal of its previously stated position, have also indicated they may soon follow suit.

The APIs in question are Named Pipes and Mail Slots, which are interprocess communications. "Named Pipes is being considered in light of the need to provide a base for all industry applications," IBM spokesman Scott Brooks said last week. "IBM has not announced support for Named Pipes."

Increasing support for Named Pipes and Mail Slots is not necessarily to Microsoft's advantage, according to competitors.

Dulling the edge?

Microsoft, trying to make a name for itself in communications with LAN Manager, welcomes such support. But Novell and Banyan claim that support for these APIs eliminates Microsoft's edge. "We will not let Named Pipes be the differentiators between us and someone else," said Anand Jagannathan, vice-president of business development at Banyan.

Despite IBM's hedging, Novell last week took the initiative and announced two products: Netware support for Named Pipes and Mail Slots and Nondedicated Netware for OS/2, a Netware alternative for OS/2 server-based applications. Both products are slated to ship during the fourth quarter.

Nondedicated Netware for OS/2 allows OS/2 and Netware to coexist on the same server with some performance degradation. The product is positioned as a entry-level option for OS/2 server-based applications.

Lotus does one better on 1-2-3

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Users can expect dramatically faster recalculations, improved local-area network support, multidimensional spreadsheets and a better data base in the forthcoming Release 3 of Lotus Development Corp.'s 1-2-3, company officials said last week.

To prepare users for the release, the firm said, it will begin shipping preview kits in April that include technical information and software for compatibility testing. Release 3 is slated to ship in the second quarter.

In addition to rewriting 1-2-3 entirely in C for the sake of portability, Lotus has put much work into boosting the product's performance. The package includes the minimal recalc approach featured in the Lotus Speed-Up utility as well as background recalculation. Users reportedly can also change data while a recalculation is taking place, a feature Lotus called a first. Lotus did not provide specific benchmark figures to support its performance claims.

While declining to give details, Lotus officials argued that the networking capabilities of Release 3 will be superior to those of Lotus Networker, the LAN-based version of 1-2-3 many users consider overpriced.

The system uses a technique adopted from host applications called optimistic concurrency control. "It is only when two users collide that they realize they are sharing a file," said David Reed, vice-president of research and development for Lotus's PC spreadsheet operation. This will operate in multiple instances when the product is running under IBM's OS/2, Reed said. The oft-maligned data base capabilities of the product will be substantially improved and reportedly will include multiple table joins and a query optimizer.

Another new and previously unannounced feature is asynchronous redisplay, a feature that lets macros execute without continuously updating the screen. Unlike the current version, Release 3 will require a hard disk.

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IBM struggles with Token-Ring board supply

BY PATRICIA KEEFE
CW STAFF

IBM acknowledged last week that it will not be able to rectify its ongoing shortage of Token-Ring boards by the end of this quarter as planned but expects to resolve the problem by midyear.

A spokesman confirmed that Ned Lautenbach, president of IBM's National Distribution Division, told analysts earlier this month that he was more optimistic about the situation being brought under control by the second quarter. According to IBM, Lautenbach told analysts, "We have underestimated demand for over a year now, and we continue to ramp up."

However, even a second-quarter solution may be unlikely, according to an analyst who spoke with another IBM executive. Frank King, a vice-president of development at IBM's Entry Systems Division, said he was not sure when IBM would be able to meet demand, according to Thomas White, president of Infonetics, Inc. in Santa Clara, Calif.

At a November analysts' briefing, Ellen Hancock, president of IBM's Communication Products Division, announced that IBM would be able to ship boards in volume by the end of the first quarter.

IBM has been plagued by its inability to ship Token-Ring boards in volume since the boards first began shipping in March 1986. IBM has consistently cited voracious demand as the reason behind the boards' lack of availability.

Popularity on the upswing

Last fall, IBM executives said 85% to 90% of their top 250 customers had accepted the Token-Ring as a major architecture. Further, IBM has said its Token-Ring shipments increased five times from 1986 to 1987 and predicted volume would double again this year. In November, Lautenbach said IBM had installed more than 12,000 Token-Ring networks supporting more than 200,000 users. Last week, an IBM spokesman would only say that Token-Ring sales quadrupled through its reseller channels last year.

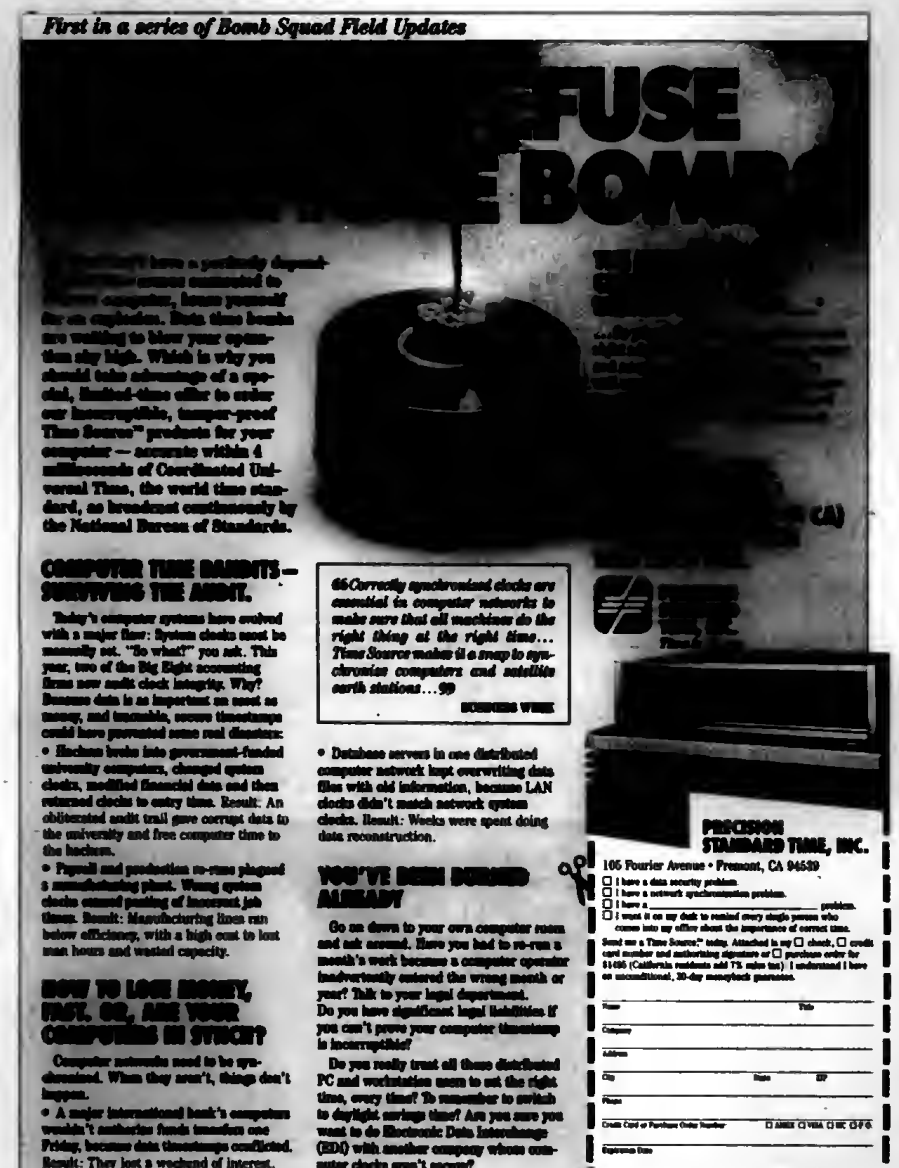
"It's getting beyond the point where you can accept what they say about underestimating demand," said Cecilia Brancato, an analyst with Oppenheimer & Co. in New York. "It appears there must be some other problem."

Surprisingly, IBM's woes have not necessarily resulted in gains for competitive token-ring board suppliers.

Many MIS shops have chosen Token-Ring for their architecture and want to go "true Blue" with their networks, according to Mike Baron, an engineering and sales representative at Valinor, Inc., a network reseller based in Lowell, Mass.

Baron, who resells 3Com Corp.'s token-ring boards for personal computers, said that although users have no qualms about buying 3Com's network software, they are hesitant to substitute non-IBM hardware when dealing with orders of 100 to 500 adapter cards.

First in a series of Bomb Squad Field Updates



COMPUTER TIME BANDITS— SURVIVING THE AUDIT.

Today's computer systems have evolved with a major flaw: System clocks must be manually set. "So what?" you ask. This year, two of the Big Eight accounting firms now audit clock integrity. Why? Because data is as important an asset as money, and insensible, secure timestamps could have prevented some real disasters:

- Hackers broke into government-funded university computers, changed system clocks, modified financial data and then returned clocks to entry time. Result: An obliterated audit trail gave corrupt data to the university and free computer time to the hackers.
- Payroll and production re-runs plagued a manufacturing plant. Wrong system clocks caused posting of incorrect job times. Result: Manufacturing lines ran below efficiency, with a high cost to lost man hours and wasted capacity.

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BUSINESS WIRE

- Database servers in one distributed computer network kept overwriting data files with old information, because LAN clocks didn't match network system clocks. Result: Weeks were spent doing data reconstruction.

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High-end Cybers to combat 3090s

BY JEAN S. BOZMAN
CW STAFF

MINNEAPOLIS — Control Data Corp. last week enhanced its 5-year-old line of Cyber 990 computers with two high-end machines, the Cyber 992 and 994.

The two systems, along with an improved Fortran compiler, are intended to compete with IBM 3090 Model 180E and Model 200E machines, which are being bid to CDC's traditional base of university and scientific accounts.

Existing Cyber 990 users will be able to upgrade to the new models by adding a second I/O unit and additional memory, according to Michael Dech, director of tactical marketing for CDC's Computer Systems and Services Group. The systems are scheduled for delivery in August.

The 992 and 994, CDC's largest general-purpose mainframes, have a main memory of 256M bytes — twice that of previous models — and twice the I/O capacity with the introduction of a second I/O unit. The Cyber 994's primary I/O unit can support 24 channels at 3M byte/sec., while the second I/O unit can support 28 more channels at 15M byte/sec.

The Fortran compiler enhancements improve performance by 20%, the firm said. The tool has a loop unrolling feature that uses artificial intelligence software to realign Fortran loops for faster processing. Additional Fortran releases, scheduled to be shipped in six months, would boost system performance another 15%.

Dech said CDC's models, which have 64-bit architecture, compare favorably with IBM's 3090s, which recently acquired 43-bit addressing.

The Cyber 992 is priced at $1.9 million for a single-processor machine with 64M bytes of memory, 10 direct-memory access processors and eight direct-memory access channels.

The Cyber 994 is priced at $2.1 million for a single-processor machine with 64M bytes of memory, 20 peripheral processors and 24 standard channels. Additional memory can be added in 64M-byte increments at a price of $7,500 per megabyte.

Flaw in IBM Cobol 85 compiler seen as minor; options revealed

BY CHARLES BABCOCK
CW STAFF

IBM's mainframe Cobol 85 compiler failed only one portion of the National Bureau of Standards (NBS) test suite, and that failure occurred in an area likely to affect few users, according to two Cobol experts.

But IBM may still need months of development effort to convert the compiler into a commercial product, the experts said last week.

The Validation Summary Report issued by the Software Standards Validation Group of the NBS said IBM's VS Cobol II compiler returned the wrong record size when the Cobol phrase RECORD IS VARYING DEPENDING ON was used under a specific condition. The wrong value was returned when the operating system was asked to read variable-length records in conjunction with relative I/O.

"Variable-length records would be very uncommon in an MVS production environment," said William M. Klein, product planner at Application Development Systems, Inc., a San Jose, Calif., producer of a Cobol debugger.

"Less than 1% [of users] use relative record I/O. Of those, only 1% use relative I/O. I suspect this is something IBM overlooked," noted Roger Knights of SPC Systems USA in Seattle, producer of a Cobol report writer marketed by IBM.

Both Knights and Klein said IBM will be able to correct the error before Jan. 1, 1989, when its compiler is scheduled to be tested a second time.

Flaw linked to record length

The compiler returns the correct record length when asked to read fixed-length records because the length "corresponds with the maximum record size declared in the Cobol program," an appendix in the NBS report stated. When a record smaller than the maximum is written, "the I/O control system pads it with blanks," returning an inaccurate value.

The validation test was conducted under Version 1 of IBM's MVS/XA on an IBM 3081 mainframe. The current version of MVS/XA is 2.2.

The mainframe Cobol 85 compiler could pass the tests and still not be ready as a commercial product because it might lack well-phrased error messages or other user-oriented features, Knights said.

The validation report revealed that IBM added two optional modules to its compiler that were not necessary to pass the test. IBM requested that the modules be checked anyway, and both passed without discrepancies. One is a debugging module, and the other was a segmentation module.

Sun's 386

CONTINUED FROM PAGE 1

simulate a complete IBM Personal Computer environment so that they can run PC-based applications.

The system is currently being beta-tested by Sun end users and OEMs.

Sun's Intel Corp. 80386-based system, the company's first Intel-based machine, was developed at its Billerica, Mass., division. The system has been ready for several months but was delayed while company officials wrestled with positioning issues, sources said.

Choice is yours

With the introduction of an 80386-based system, Sun will be providing its customers with a choice of three different architectures: its traditional systems, based on the Motorola, Inc. 68000 series microprocessor, the newer scalable processor architecture systems, based on Sun's own proprietary reduced instruction set microprocessor, and systems using the Intel chip.

The addition of an Intel line allows Sun to further extend its philosophy of one operating system for multiple architectures, industry observers said.

"They want to offer the customer a choice," said Michael Orsak, industry analyst for Robertson, Colman & Stephens. "All systems are Unix-compatible so that the architecture becomes less of an issue."

It also allows Sun to get a foothold in corporate accounts committed to either Intel-based systems or MS-DOS.

Initially, Sun will market the system primarily through value-added resellers (VAR), thereby avoiding direct competition with IBM PC-compatible makers, like Compaq Computer Corp., that sell strictly through retail channels. Last November, Sun launched its VAR program. The number of VARs currently qualified under that program remains undisclosed.

Sun, however, is investigating the possibility of entering the dealer channel, sources added, a decision that is not expected to be made soon. "I don't see them being a direct threat to Compaq," Orsak said. "It takes an awful lot of effort to set up retail distribution. That's been Compaq's strength."

Senior Editor Ed Scannell contributed to this report.

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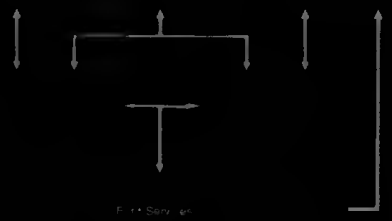
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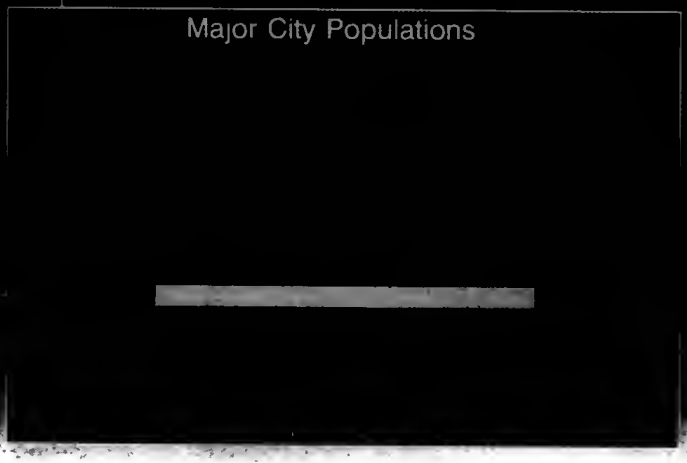
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Firms fuse LU6.2 into offerings

Spectrum, Communications Solutions answer peer-to-peer demand

BY KATHY CHIN LEONG and ELISABETH HORWITT
CW STAFF

Pointing to a growing interest among large companies in IBM's LU6.2 peer-to-peer protocol, two firms introduced products last week that incorporate basic LU6.2 functions.

Communications Solutions, Inc. in San Jose, Calif., announced a local-area network gateway that supports both IBM 3270 and LU6.2 applications. And today, Spectrum Concepts, Inc. is scheduled to introduce Xque, an enhancement to its Xcom 6.2 software that allows files to be automatically extracted from an IBM System/38 printer spool and routed to another System/38 or 370 host running MVS.

Spectrum's Xcom 6.2 is a line of software that uses LU6.2 protocols to provide peer-to-peer batch file transfer to IBM and non-IBM systems. Xque was requested by users who wanted to print System/38 documents on an MVS high-speed 3800 laser printer, according to Mark Favelson, the company's XCom marketing manager.

Without Xque, users can manually intervene to route files from a System/38 to a 370 but cannot set up unattended printing functions, Favelson said.

In Silverlake's future?

Xque is currently being shipped as a standard feature of all Xcom 6.2 products, the vendor said. While the enhancement currently supports the System/38, it was developed with the idea of eventually supporting Silverlake, IBM's expected integration of its System/38 and 36 computer lines, Favelson said.

Spectrum is in the process of certifying Xque's compatibility with LU6.2 gateways that have been announced by Communications Solutions, Eicon Research, Inc. and Novell, Inc.

Communications Solutions' Maxess Systems Network Architecture gateway, announced last week, concurrently supports LU6.2, IBM 3270 and Synchronous Data Link Control connections between networked IBM Personal Computers and hosts.

Maxess takes the place of an IBM cluster controller, but unlike the controller, which can recognize only 32 physical devices, the $4,995 Maxess can allow 32 concurrent host sessions to be shared among an unlimited number of networked PCs, Communications Solutions claimed.

The workstation software supports IBM's Advanced Program-to-Program Communications/PC protocol but takes up approximately 120K bytes less main memory than IBM's product, Communications Solutions claimed.

Maxess addresses a perceived user demand for network management in two ways. Emulating an IBM cluster controller, it can send basic alerts to IBM's Netview system. Maxess also allows users to gather information from a LAN and display it on a LAN workstation.

Set to ship in April, the product supports any IBM Netbios LAN and has been successfully tested with Novell, 3Com Corp. and IBM Token-Ring network products; Comminications Solutions said. Maxess represents the first in a line of gateway products that will eventually support IBM Personal System/2 machines, IBM and Microsoft Corp.'s OS/2 operating system and CCITT X.25 protocols.

Siemens puts Saturn on ISDN orbit

BY JAMES DALY
CW STAFF

BOCA RATON, Fla. — Siemens Information Systems, Inc. mapped out the next leg of its journey to the Integrated Services Digital Network (ISDN) telecommunications standard last week with the introduction of Cornet, an ISDN Primary Rate Interface for its Saturn private branch exchange (PBX) line.

Cornet also includes Siemens' version of D channel messaging formats that can support a variety of services over an ISDN connection. Both products are scheduled for mid-1989 availability and will sport $15,000 price tags.

The Primary Rate Interface defines a high-speed 1.5M bit/sec. connection consisting of 23 64K bit/sec. B channels and a separate D channel to carry signals. The interface is commonly used as a high-speed pipeline between customers' switching equipment with hosts and carrier central office switches.

Islands of their own

"With Cornet, users can establish private islands of ISDN PBX networks in their own time frame and access the public network when it becomes available in their area," said Scott Augerson, group product manager for systems and networks at Siemens.

The vendor is encouraging information service companies and other equipment vendors to incorporate its D channel messaging formats into their own products, Augerson said. The D channel message set standardizes how various ISDN-compatible devices communicate. Although Augerson noted that a final ISDN standard for the format is at least four years away, Cornet's design allows incremental modification of its messages to maintain adherence to the standards.

But some analysts chafed when confronted with the protocol Siemens claimed in the "least proprietary" of existing PBX protocols. "That's like saying, 'I have the least case of leprosy,'" said Thomas Nolle, president of CIMI Corp., a Haddonfield, N.J., consulting firm. "The benefits of ISDN are related to standardization, and we're not going to have that if we upgrade existing proprietary interfaces with ISDN features. Siemens had the first commercially available ISDN chip set, so why, at this stage, come up with a quasi-proprietary standard even if you make it available?"

It was a dark and rainy night . . .

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — The morning after a violent rainstorm here last August, water began to trickle under the 18-in. raised floor at Household Financial Services' (HFS) suburban computing facility. It soon flowed in a torrent that would submerge the company's computer room under two feet of standing water for more than 24 hours.

In that time, minnows and carp swam freely in HFS's computer room, lodging in its computer cabinets. Several IBM 3090 mainframes were ruined.

"You could clearly hear the water flowing," recalled Gregory Hedges, HFS's data security manager, who told the chilling tale to 500 fellow customers of Comdisco Disaster Recovery Services, Inc. at a Florida meeting earlier this month.

"People who came to work wearing very nice shoes and suits had those clothes ruined as they tried to save tapes, paper forms and supplies that would be needed in the backup site," he said.

Ready for anything

But HFS was prepared to replace any ruined clothes, as well as to tend to hundreds of other details, because it had a thorough disaster recovery plan that was revised in 1987. Hedges and a team of MIS managers had been updating the plan as officers of a financial organization that authorizes credit card purchases, processes personal loans from 850 Household Finance Corp. (HFC) loan offices and supports transactions at 70 locations nationwide. They had no way of knowing that nine inches of rain would fall in 12 hours, ending on Aug. 14, 1987, causing nine Chicago-area businesses to declare flooding disasters.



Rains turned *computer room into a high-tech fishin' hole*

Hedges, who had arrived to work at 7:30 a.m. that day, said an emergency meeting of MIS and corporate officers was called by 9:30. By 10 a.m., a disaster had been declared. This made two of Comdisco's three Chicago-area hot sites available for HFS operations. Power was out in the area, as was most phone service, and most roads were blocked by the floodwater for most of the day.

The disaster recovery plan spelled out tasks so that substitutes could replace tired or incapacitated workers, if necessary. It even took into consideration the possibility of loss of life, Hedges said. The plan resulted in the restoration of minimal system operations by 11 p.m. the first day of the flood.

"You didn't have to tell people what to do," recounted Sandra Akemann, assistant vice-president at HFS, who helped write the plan. "We had been through three dry runs before this."

Within 13 hours of the declaration of a disaster, HFS and Comdisco had restored the key operating systems on hot-site machines. The disruption did not paralyze HFC's business, Hedges said, since the plan called for collecting local data and posting it within 24 hours. Four days into the disaster recovery effort, normal operations were restored.

Within 10 days, HFS's computer room had been decontaminated, refurbished and outfitted with new mainframes and disk drives. Fifteen days after the disaster hit, HFS operations returned, in a caravan of 17 cars full of data tape, to the firm's Prospect Heights, Ill., headquarters.

Data comes first

The first task of the disaster recovery plan, which identified key functions and established priorities, was to rush vital financial data, which had been updated late on Aug. 13, to the hot sites, located in nearby Wood Dale. The software team then brought up IBM's Transaction Processing Facility/Airline Control Program transaction operating system on the hot site's IBM 4341 mainframe and brought up MVS/XA on Comdisco's IBM 3084 Q.

At the same time, HFS asked IBM and National Advanced Systems to replace the ruined equipment, which included two IBM 3090 mainframes, two 4381s and a 3033, along with IBM 3380-type disk drives; however, HFS declined to specify what it now has in operation.

An IBM field engineer removed one head disk assembly from a vital disk drive for use at the Comdisco hot site. The move allowed HFS to restore all Aug. 13 transactions. About half of the 400 people on HFS's data processing staff were assigned official roles in the disaster recovery plan. The remainder formed a resource pool, Akemann said, that filled the gaps in manpower.

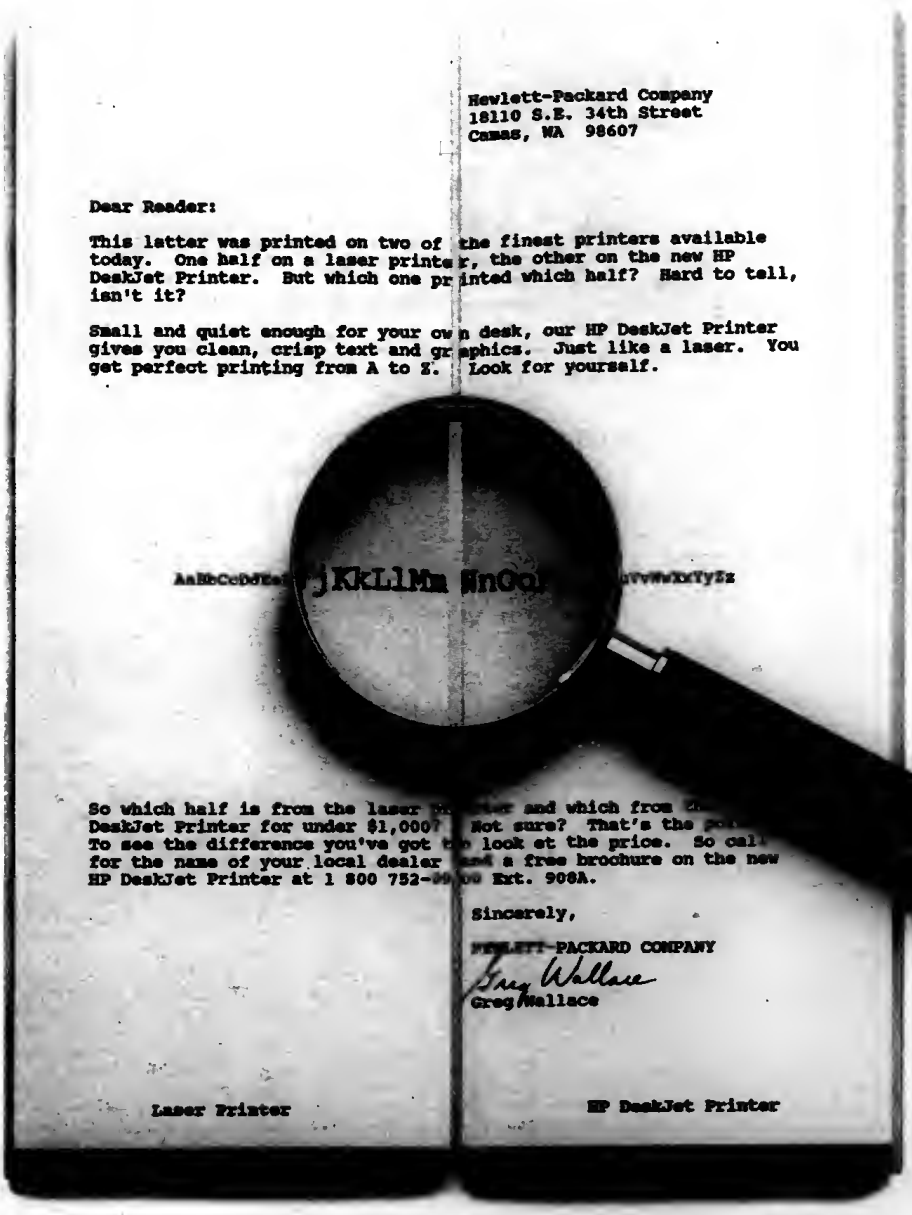
HFS's plan worked because it addressed details, such as the replacement of ruined clothes, as personal issues. It did not, however, anticipate that a flood would be caused by local municipal variances, which allowed two neighboring corporate campuses to drain rainwater over HFS's grounds.

"HFS's drainage could have handled the runoff from one corporate campus," Akemann noted, "but not from three."

Landscaping changes made since the flood are designed to prevent a repeat of the disaster, Akemann added.

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EDITORIAL

Nothing like it

TO PREDICT THE impending death of mainframe computing has been one of the industry's great fads of late. But IBM's announcement of a new version of MVS shows that the country's largest companies just aren't buying that line.

When it releases MVS/ESA later this year, IBM will give users of its largest mainframes an 8,000-fold boost in addressable memory space, although it will limit most of that additional capacity to data. It is significant that MVS/ESA was announced so soon after a period IBM had declared "The Year of the Customer." The company spent a lot of its time in 1987 in earnest discussions with its largest customers. Those users have been hearing a confusing array of messages. They've heard departmental computer makers tell them that networked minis are the best way to handle data. They've heard Microsoft say that Intel 80386-based network servers are the way of the future. And data base vendors have held forth the Holy Grail of distributed data base management systems.

But after hearing all the pitches, those customers apparently came back to IBM with a simple message: Move the applications out to the field, but give us central control over data.

That message makes a lot of sense. Data is increasingly becoming the lifeline of large organizations. The thought of breaking up and distributing that data without adequate controls on concurrency, security and integrity is enough to set an MIS director's teeth on edge.

But at the same time, users are pushing to distribute applications to the lowest possible level. PCs have taught us that data should be separate from the mechanisms that use it. Given the proper set of tools, end users are capable of thinking up remarkably creative ways to solve their problems. And those approaches have created an insatiable appetite for more data to manage.

When IBM introduced MVS/XA seven years ago, its 2G-byte address space seemed like an ocean. But applications like automated teller machines, credit card authorization systems and integrated manufacturing systems have quickly gobbled up that space. At the same time, PC power users and departmental computers have been hitting on the data center for higher quality information — and more of it.

IBM has put three critical strategies in place to address this trend. Its cooperative processing thrust and Systems Application Architecture acknowledge that users should process data as they please, regardless of the hardware it runs on. MVS/ESA, on the other hand, gives MIS the tools it needs to deliver data quickly and in large volumes. The strategy will take years to evolve, but it represents some sound thinking.

IBM has recognized that each component of an information system has its place. PCs are a terrific window on the world — friendly, responsive and fast. Minis and local-area network servers do a good job of sharing information locally. But when it comes to crunching raw numbers, IBM believes you still can't beat a mainframe.



LETTERS TO THE EDITOR

Section 1706: Up in arms over a taxing situation

The story "Independents' backs to the barricades" [CW, Feb. 1] appeared to be written by a lawyer from the brokers trade association.

I am very disappointed in the manner in which *Computerworld* handled this important issue. I suggest you give equal opportunity to the other side of the story. I am sure I can be instrumental in making appropriate information available.

John R. Rapasky Jr.
Chairman, Chief Executive Officer
Zink & Katich, Inc.
Lansing, Ill.

As president of a professional services company, I found your recent story on independent contractors misleading and inaccurate. Congress passed Section 1706 as part of the tax reform act to eliminate tax loopholes and abuses permitted by the safe harbor clause. To reverse this to benefit an elitist group of workers would make a mockery of tax reform. It is time to report the whole story.

Robert A. Jones
President
Computer Dynamics, Inc.
Southfield, Mich.

The article on Section 1706 disappointed me. The headline, "Independents' backs to the barricades" and the construction barricade design promised a balanced report. Instead, I felt I was reading a partisan press release. If your construction barricade means the author is still writing, please run the next installment.

I would like to read more news directly from the Internal Revenue Service, other responsible organizations like ADAPSO and some congressmen who voted for Section 1706.

Tell me why the independents are up against the barricades. I still don't know. The author made it sound like they are far from the barricades, grouping beneath a wing of a Washington lobbyist's special interest group and shouting jingoistic slogans. Maybe the story should have been titled "Independents promise to make matters worse for management."

Except for the U.S. Department of the Treasury, Section 1706 was far from a pleasant experience for anyone, including Mincron SBC Corp. By the way, how much more revenue has been collected with the imposition of Section 1706?

Regardless, the last thing any of us needs is more change in the tax code.

Frank Prescott
Director of Recruiting
Mincron SBC Corp.
New York

The article "Independents' backs to the barricades" is an inaccurate assessment of Section 1706's effect on independent contractors in MIS industries. The section does not impinge on the mobility of independent contractors. It simply clarifies and corrects a situation in which, prior to 1706, individuals were allowed to represent themselves as independents and to receive tax benefits they were not entitled to.

The author's reference to amend or overturn the law would allow tax benefits to a small group of individuals that are not available to everyone else. Section 1706 is a fairness issue. Why not report the facts as they really are and present those sides of the issue?

Robert S. Forman
President
IMI Systems, Inc.
New York

The story "Independents' backs to the barricades" only presented the position of independent contractors opposed to Section 1706.

In the spirit of fairness and good reporting, *Computerworld* should inform its readers that the article only represented those independents seeking to alter Section 1706. It is time for proponents of 1706 to voice their views.

Robert J. Sywolski
Chairman, Chief Executive Officer
Cap Gemini America, Inc.
New York

The independent contractors do not have their backs against the barricades, the brokers do. Frankly, it is the confusion that is continually fostered by comparing apples with oranges that angers me. I am an independent contractor and have been one for quite a few years. The new law has not affected me or the customers I meet in any way. But then again, I operate a business, not a loophole.

Bill Ek
Independent Contractor
Los Angeles

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

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Computer ethics for cynics

Students need to learn that people matter and can be trusted

BUCK BLOOMBECKER



"Being ethical only allows other people to take advantage of you."

This bit of cynicism came from a college student after listening to a recent speech of mine, "Why I'm not a computer criminal." Clearly, my effectiveness at communicating the importance of ethics in a computer security strategy was less than 100% that night.

I shouldn't have been surprised. The student who spoke was enrolled in a computer science program that offered no ethics courses. As such, he was like virtually every other computer student in the U.S. A mere handful of schools offer computer ethics courses.

Faculty members praise me for coming to town to speak about about computer ethics. They explain that with all the important changes in technology, they just don't have the time to teach that subject.

Double-edged teaching

In teaching students to value technology so highly, we often imply that they need not value people.

This approach is likely to turn out employees who come to work in data processing departments needing remedial ethics education. For starters, we will have to teach them that people matter and can be trusted. It is an uphill battle, but fortunately, there are signs of hope.

The blindness to the importance of human values among college faculties is very often matched by a similar attitude in the computer security professionals and MIS managers entrusted with safeguarding computer-related assets.

'Integrity' a dirty word

One industry reporter wrote recently, "Interviews with several companies . . . reveal that rather than using sophisticated electronic security systems, the most common method of security is reliance on employee integrity."

Never before had I seen "integrity" used as a dirty word. The implication seemed to be only a step in cynicism away from that of my collegiate listener. Rely on integrity? That would be the last thing a high-tech company would ever do if it were serious about security.

According to Hewlett Packard's computer security manager, Hans von Braun, "Most companies base their security standards on 'low trust' and countermeasures." In contrast, the HP way is "high trust" — focusing on rewards for doing things right. In practice, this means that von Braun restricts his programmers far less than many of his colleagues in the security field do.

"Bank security people are appalled at our lack of limitations," von Braun says. Administration of HP's ACF2 access control system is decentralized. Occasionally, von Braun will check, but he leaves most of the administration of security to systems programmers.



TOM LULEVITCH

"Trusting employees is central to our way of doing business," he adds. "It leads to a lot of innovation when they have freedom."

Convincing co-workers and others you rely on to follow your company's ethical standards goes with the management territory. In fact, as computer crime becomes recognized as a more serious threat, the necessity of ethics will become more evident, and the pressure on managers to motivate their staffs to ethical action will increase.

If the pressure does not come from within, it will come from professional organizations attempting to justify the claim that their members are professionals. If the organizations don't apply pressure on their own, eventually, the law will require ethical standards in response to public demand after some major calamity.

W. Michael Hoffman, director of the Bentley College Center for Business Ethics, reports that the implementation of ethics programs is on the rise throughout the business community.

Hoffman points out that most companies have established ethics codes and that an increasing number are establishing committees to enforce them — ombudsmen to counsel employees about ethical dilemmas and, occasionally, even judicial boards to handle ethics violations.

Ignorance not bliss

Pierre Chenebert of Hydro-Quebec reports that computer ethics awareness has made a significant difference at his company. After the internal auditors reported that a password system was needed to protect the company's on-line processing system, he called on the Canadian consultancy DMR Group to develop a companywide ethics awareness program.

"Our corporate culture was exactly the opposite of that in banking," Chenebert explains. "Employees saw no reason to protect data." In the course of the awareness training, he found that people were selling data maintained by the company because they were not aware of its confidential nature.

"Once they understood the nature of the material and the morality involved," he says, "they agreed they should not do it." Software piracy stopped, and a password system was established without resistance from the employees or their unions.

Many consultants agree with a people-centered approach to computer security. Crimes occur not only because there are people who want to commit them, but also because those people think they will not get caught.

This judgment often depends

Continued on page 18

BloomBecker is director of the National Center for Computer Crime Data in Los Angeles.

Welcome to the complex and messy world of integration

JOHN KIRKLEY



At a Chips and Technologies press conference last month, there were the media and the message. The media included a new-age video with sea gulls and sunsets, a somewhat balky slide show and sincere executives speaking earnestly to a roomful of business and trade journalists.

The main message was the introduction of the company's new high-end IBM Personal System/2-compatible chip sets. But as the morning progressed and reporters began asking questions, a sense of reliving history began to creep over the more gray-haired members of the press corps.

It started when someone asked about IBM's marketing strategies for the PS/2 line.

Same game, new name

"It's a mainframe game," said one of the Chips and Technologies luminaries. "IBM is selling the PS/2s just like they sold mainframes. It's going to be more difficult for companies — the clone makers, for example — to compete. It will take more money and more resources. But Amdahl and other IBM-compatible mainframe companies proved it can be done successfully."

After all the PC hoopla, once again, it's a mainframe game. The new Intel 80386-based machines give you the power of a mainframe on a desktop.

Blinding speed, multitasking, cache memories, interleaving and, of course, the ability to tap into the resources of the corporate computer all make the PS/2 Models 50, 60 and 80 a formidable family. The clones that will appear later this year will be even faster and more powerful than the IBM machines they emulate, according to Chips and Technologies.

End users still hungry

Even without these new powerhouses, today's minimum technological starter set for many organizations is an Intel 80286-based machine with graphics capability and 20M bytes of storage. The more voracious, MIPS-esting end users are calling for, and receiving, 386-based PCs or Apple Macintosh SEs or Macintosh IIs.

The rise of networks — in particular, PC local-area networks — is likely to accelerate during the next five years. Concurrently, there will be a decrease in time-sharing systems and the continuing decentralization of computing resources that has been going on for more than a decade now.

There is much talk about two- and three-tier architectures; that is, terminals, PCs and workstations tied directly to the mainframe vs. an architecture in which mid-range departmental systems sit between the mainframe and the end-user desktop machines. There's a certain neatness to each of those scenarios.

> **DATA, applications and users will interact by intricate and organic means to form a much more complex and egalitarian system.**

Real life is messy

But in real life, the connections between users at all levels of the organization — between hierarchies of equipment, between LANs, larger corporatewide networks and global wide-area networks — will evolve in a much more functional and messy way.

In all likelihood, data, applications and users will interact by intricate and organic means to form a much more complex and egalitarian system than that implied by the two- and three-tier models.

The massive move to connections at all organizational levels creates additional challenges and opportunities for MIS.

IBM, traditionally the purveyor of the two-tier model, is evidently going to provide MIS with a tool to regain at least a modicum of control. The firm is allowing some users to play with a diskless version of the PS/2 Model 50 equipped with the Micro Channel architecture. One of the motivations for building the system is to let MIS organizations control the data and applications that end users can access from the mainframe.

Continued on page 18

Kirkley is a computer industry writer, editor and consultant based in Warwick, New York.

Integration

CONTINUED FROM PAGE 17

But despite the obvious appeal to MIS managers who prefer centralized control, this move is hardly the harbinger of a return to the good old days when the data processing center held the keys to the kingdom.

End users have tasted freedom, they have become much more sophisticated technologically, and they intend to control their own data.

Managerial misconceptions

One information systems professional, who is now working outside his company's MIS department, says, "The managers in the MIS shop are still doing the same old thing. It takes months — in some cases, years — to get an application to run. Mostly, they're maintaining tons of old code. They think they are controlling the data base, but the fact is that the users are building their own data bases on the hard disks of their 286- and 386-based PCs."

Another manager within MIS presents a different view. "We say, 'To hell with technology.' " He and his MIS colleagues are configuring their organization's systems based on the way the corporation's structure is evolving, instead of reacting to the latest releases of hardware and software.

With the mainframes on the desk top tied to the mainframes in the data center, with the corporation awash in millions of instructions per second, with end-user computing growing and with networking changing the face of organizational information resources, MIS departments are going to be hard pressed to develop unique strategies that meet the constantly changing needs of their organizations and end users.

MIS omnipotence obsolete

There is no one way to meet the demand. In the light of current developments, the entire relationship between MIS and the end-user community has to be rethought.

The old formulas won't work. Neither the old role as the high priest of DP wielding ultimate control nor the opposite persona of the laissez-faire consultant fits today's environment.

Instead, 1988 marks the beginning of a new era characterised by closer interaction among management, MIS, end users and vendors. The demarcations among these elements are blurring and shifting.

Management is becoming more oriented toward the strategic deployment of information resources. MIS is becoming more involved in business strategies and long-range corporate planning. Users are growing in technological sophistication and taking responsibility for their data and applications development. And vendors are beginning to offer consulting services to address the managerial and strategic planning concerns of their customers, in addition to providing the latest hardware, software and networking systems.

Having lost the power of its autonomy, MIS must search out ways it can fit in with the variables of this new, complex equation.

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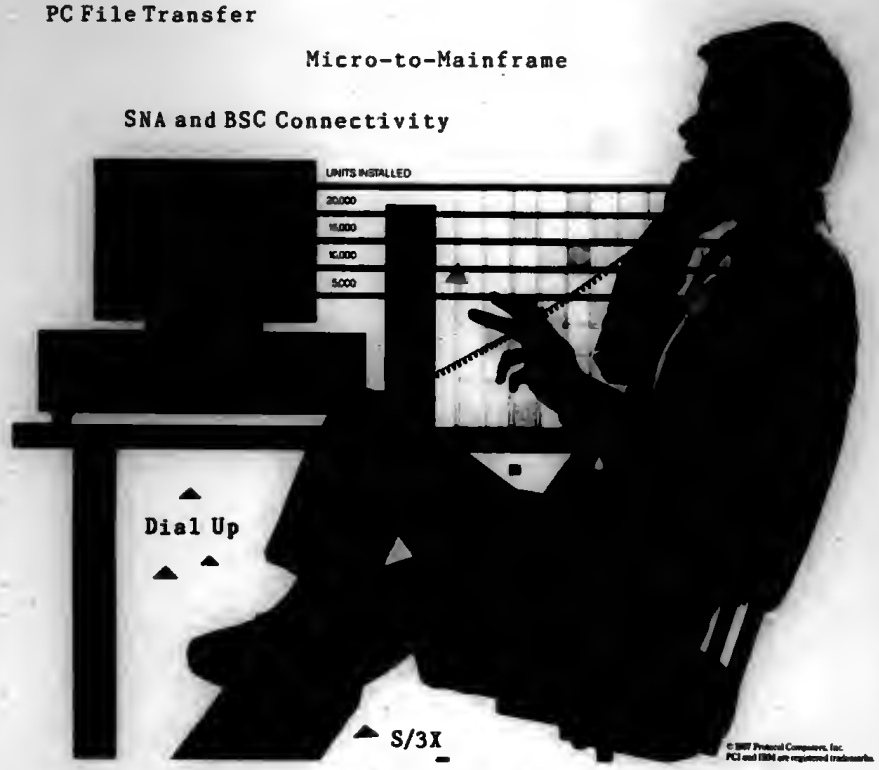
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Computer ethics

CONTINUED FROM PAGE 17

on the ethics of those around the would-be criminal. If no one questions the sudden appearance of a luxury car parked in the employees' parking lot, its owner feels safe as he continues to steal from the data center that he's supposed to be running. If no one asks why one woman on welfare has 36 children, she will continue to submit claims and cash her benefit checks.

Crime detection is only the most obvious benefit of ethics education for those who work in data processing. Consultant Danielle Pouliot from DMR Group lists a number of results: better understanding of the validity of security; clarification of the organization's expectations; clarification of each employee's responsibilities; acceptance of new responsibilities in computer security; development of more employer-employee cooperation; and the development of a feeling of belonging.

The benefits of teaching — and learning — ethics are too important to let them get drowned in cynicism.

This week in history

Feb. 27, 1978

Overall U.S. data processing spending will rise 13.1% during 1978, fueled by increased demand for hardware to improve throughput and computing productivity, International Data Corp.'s annual computer industry market forecast predicts.

Feb. 28, 1983

The data processing industry, the scientific community and segments of Congress are up in arms over a Reagan administration decision to crimp funding of the federal government's computer standards program from $10 million to $3 million. Such a cut would virtually eliminate the Institute for Computer Sciences and Technology of the National Bureau of Standards — a program whose charter is to develop federal computer standards and aid government agencies in their DP use.



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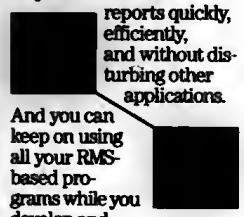
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SOFT TALK

Les Gilliam

Measuring development

Is there a practical way to measure the result of the applications development process? "Function points" appear to offer an approach that could work.

The function point concept was publicly discussed by Allan Albrecht of IBM in 1983 at Guide 57 and has been in use within IBM since 1978.

To measure function points, a procedure has been developed for analyzing an application and assigning numerical values to the input, output, internal file, interface (external) file and inquiry activities within that application.

The choice of hardware or software to be used does not matter. Further, it makes no difference which programming language is used. The measure can take place before a line of code is written, if the design is complete.

These values are then adjusted according to other application attributes, such as computation complexity, to yield a single application measure called function points.

If the cost of designing, developing and implementing that application is known, a productivity value can be calculated by dividing the number of function points by the cost.

But using only personnel costs in the productivity formula

Continued on page 23

SAA goals broaden

Cooperative, distributed processing targeted

BY CHARLES BABCOCK
CW STAFF

NEW YORK — IBM's Systems Application Architecture (SAA) has a broader underlying goal than simply providing common user interfaces and applications that are portable across hardware platforms, according to its chief IBM spokesman, John T. Friedline, manager of SAA marketing.

Speaking here at a conference sponsored by The Yankee Group on "The New IBM," Friedline stated that one of the goals of SAA is to "isolate changes of underlying hardware from application programmers."

He indicated that such a goal would not only provide application portability but would allow IBM to alter and upgrade its processors without worrying that the machine changes made a programmer's development skills or a firm's existing programs obsolete.

IBM is also banking on being able to provide, through SAA, a capacity for distributed applications across multiple hardware platforms, particularly between mainframes and personal computers.

Friedline referred to both cooperative processing and distributed processing — he did not attempt to distinguish between the two — as major goals of SAA and the reason behind the addition of CICS/MVS and IMS/VS to the SAA line-up last October.

IBM needs to provide distributed services under SAA, utility programs that provide printouts or move files across multiple systems. This effort "needs a lot of work," Friedline acknowledged.

One key to IBM's distributed approach already figures prominently in SAA — relational data base and the relational data access and manipulation language, SQL, he said.

IBM believes it must continue to offer multiple operating systems and hardware platforms because its customers require systems optimized for different tasks, the IBM official said.

MVS/XA, for example, is

Continued on page 23

Data View

Fixed-asset software

Percent of package sites



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART

PC users can tap SNA via emulation software

DANBURY, Conn. — VM Personal Computing, Inc. recently released a version of its IBM 3270 emulation software with VTAM support.

The new version is available for IBM VM/VTAM and MVS/VTAM and gives microcomputer users direct access to an IBM Systems Network Architecture (SNA) environment, the firm said. Users can dial into an IBM mainframe running VM Personal Computing's Relay/3270 and let their personal computer function as a 3270 terminal in an SNA environment. The connection is made over a telephone line. Relay/3270 runs on an IBM mainframe. PCs must run VM Personal Computing's Relay Gold to access Relay/3270. The two programs combined provide a software-only method of 3270 emulation for a microcomputer.

Because no hardware add-ons are required for 3270 emulation, a PC can function as a 3270 terminal in most remote locations, the company said. Laptop computers can participate in an SNA environment as well.

The MVS/VTAM version is available now. The VM/VTAM version is scheduled for shipment in April. Relay/3270 for MVS/VTAM can be licensed for $14,500. The VM/VTAM version will be offered for $12,500.

Current Relay/3270 users who request the VTAM support will be charged an upgrade fee that has not yet been determined, the company said.

Monitor lets users access remote screen

YORBA LINDA, Calif. — On-Line Documentation, Inc. has a new look. Release 2.1 of the Look on-line CICS terminal monitor software system lets users view remote terminal screens instantly.

The degree of remoteness affects neither the screen contents nor their immediate appearance on the user's screen, according to the company. Release 2.1 target terminals need not be predefined; definition to CICS is all that is required to bring a terminal within Look's sights.

A Look 2.1 user can set up joint viewings by calling a remote terminal operator and selecting the remote CICS terminal screen contents to be viewed from a current list of CICS sessions. An unlimited number of terminals can be monitored, and Release 2.1 includes a security interface that keeps remote screen data out of view of unauthorized parties as well as an on-line security definition process.

Look 2.1, which supports CICS Releases 1.6 and 1.7 under IBM's OS or DOS, is available now. A single-CPU permanent license costs $2,955 for DOS and $3,995 for OS.

Inside

- Computer Associates smoothes VSE-to-MVS conversion. Page 22.
- Unisys enters Executive Link into corporate America. Page 26.

Compuserve grafts on application generator

BY NELL MARGOLIS
CW STAFF

NEW YORK — A menu-driven, screen-based application generator that lets users both develop and maintain applications in a highly visual manner has been added to Compuserve Data Technologies' System 1032 product line.

System 1032, which now includes System 1032 Application Facility, or System 1032/AF, is Compuserve's fourth-generation language and data base management system for Digital Equipment Corp.'s VAX. System 1032/AF was designed as an add-on module and will be available next month, according to Laurie Conrad, senior product specialist.

The application generator's menu-based editors allow a user to specify data, menus, screens, application logic, Help messages and end-user actions — most of the application components, according to Compuserv.

At the same time, System 1032's fourth-generation language enables a user to add a custom operation or procedure. The language resembles Pascal, Conrad said.

For Lois Riskin, data base administrator at American Cyanamid Co.'s Agricultural Research Division in Princeton, N.J., a longtime System 1032 user site, an application generator that would let her build System 1032 applications with multiple data sets was something "that came not a moment too soon."

For years, Riskin reported, "we had been meaning to catalog all of our government submissions. And all of a sudden, my boss needed a full report 'a week from Friday.' "

Using an alpha-test version of System 1032/AF, Riskin produced a prototype catalog application — "my first ever with AF" — and, within a day and a half, finished the production application less than two hours after leaving the meeting at which she presented the prototype.

Trimming time

Within three days, she said, she wrote the report code that she incorporated into the application. Without AF, Riskin said, the job "would have taken two weeks instead of 1½ days, and I couldn't have included error checks and exits."

Some users like to begin development by designing data structures; others prefer to start off building menus and screens. System 1032/AF, Conrad said, accommodates both, keeping final applications consistent regardless of the order in which they were designed. In addition, Conrad added, System 1032/AF applications can integrate most VAX software and facilities.

License fees for System 1032/AF will range from $600 to $24,000, depending on CPU. Basic System 1032 prices range from $3,000 to $120,000.

SOFTWARE NOTES

'DB2-SQL Tips' hits presses

New York-based consultant George Coronado is now offering **"DB2-SQL Tips,"** a newsletter that supplements his "DB2-SQL/DS Users Bulletin." The first set of tips includes information on using naming convention standards, avoiding referential integrity problems and managing IBM's DB2 Union statement. "DB2-SQL Tips" is available for a fee of $10 to $15. Write to Box 560, Wall Street, New York, N.Y. 10005.

Systems Educational Associates, Inc. in Oak Brook, Ill., is planning to publish a $250-per-year newsletter on IBM's Systems Application Architecture (SAA), called **"SAA Age."** The monthly publication will be edited by Chuck Balsly, an IBM mid-range system consultant, and Mark Webb, former managing editor of *Scope 36*.

Sherpa Corp. in San Jose, Calif., maker of an engineering data management system [CW, Feb.8], recently acknowledged that its product can be difficult to implement and has begun offering Quickstart. The $50,000 product, a combination of services and software, gives users the base data management system, on-site training and an application template — a software layer that addresses the particular application a user wants to perform.

Morino Associates, Inc. recently reported it has acquired a minority equity interest in Elan Software Products, Inc. in San Jose, Calif., a maker of operator productivity software. The deal calls for the two companies to cooperate on product development. Elan's IMS/VS Operator Workstation product is currently available. A version for IBM's MVS and MVS/XA operating systems is scheduled for release late this year.

Quant Systems in Charleston, S.C., has collected public-domain C programs and is offering them compiled for The Santa Cruz Operation, Inc.'s SCO Xenix 286 and SCO Xenix 386, Microport Systems, Inc.'s Unix and Tandy Corp.'s Tandy 6000-compatible Xenix Development System. The programs cost $12.95 per disk and reflect the work of university professors, students and C programmers.

Apollo Computer, Inc. has reached agreements with **Software Research, Inc.** and **Time Arts, Inc.** Software Research's software analysis and testing tools now operate on Apollo workstations for work on Cobol, C, Pascal and Basic programs. Apollo will also comarket Time Arts' Lumena/32 graphics package for producing digitized color images.

Management Science America, Inc. has installed its General Ledger System for IBM's DB2 at Ohio State University Hospital in Columbus for beta testing.

Digital Equipment Corp. has enhanced its OPS5 expert system building language to offer interfaces to artificial intelligence routines written in other languages and to eliminate runtime size limits. OPS5 can now call routines written in DEC's VAX C and VAX Ada, and OPS5 programs can be integrated with programs written in VAX Basic and VAX Bliss-32.

Amperif Corp. in Chatsworth, Calif., has acquired **HDR Systems, Inc.** in Omaha, producer of a Unix-compatible SQL-based relational data base management system called Noah. Amperif offers the RDM/2 data base machine that interfaces to Unisys Corp. mainframes, minicomputers and personal computers.

Execucom Systems Corp.'s IFPS/Plus financial planning and modeling package is available on the **Apollo Computer, Inc.** family of Domain 3000 and 4000 workstations, spokesmen for the company said.

CA-Duo eases conversion to MVS

GARDEN CITY, N.J. — Computer Associates International, Inc. recently released an upgraded version of its VSE-to-MVS conversion package that is intended to help users make a smoother transition to IBM's premier operating system.

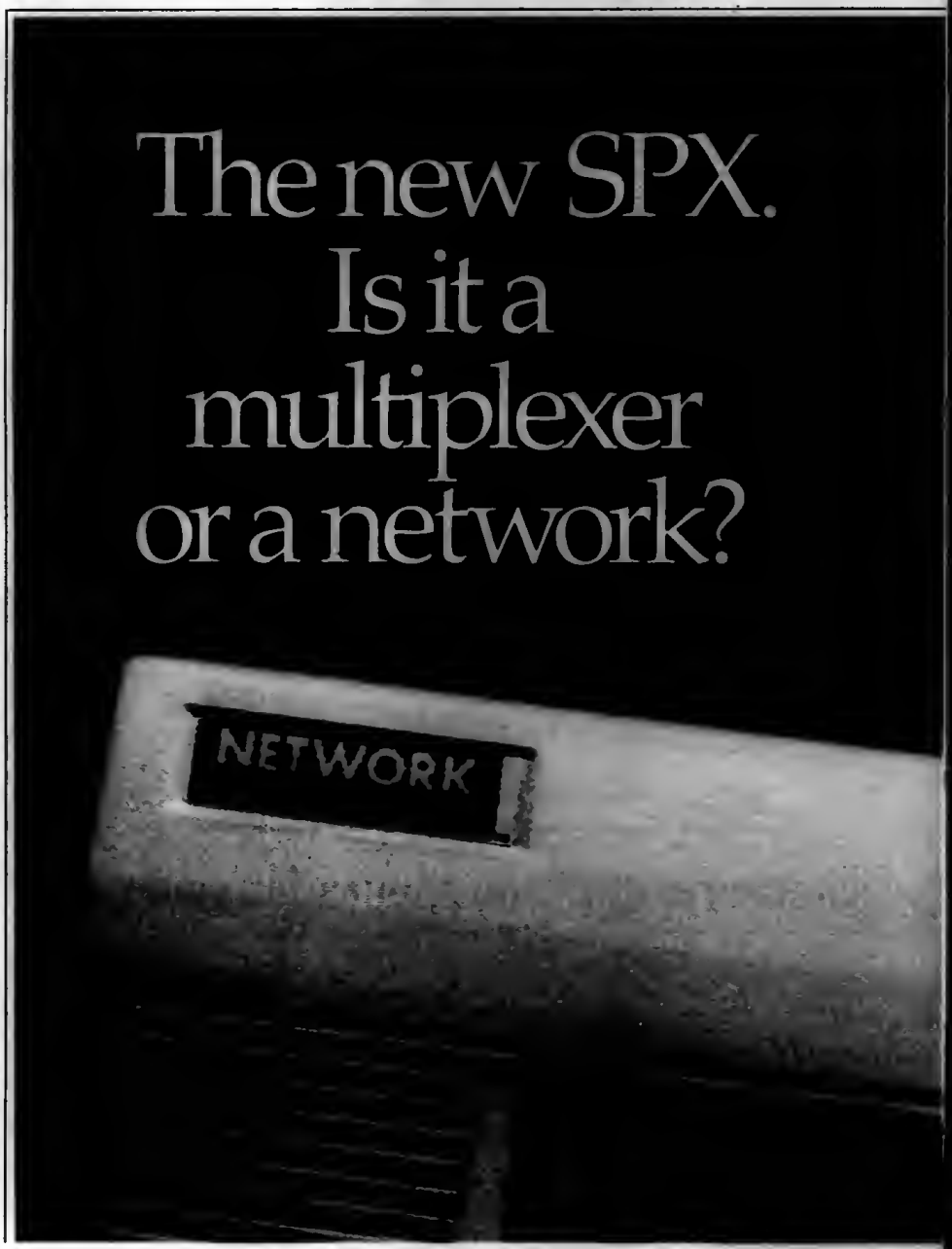
CA-Duo has been aimed at IBM DOS/VSE users moving to MVS. With Release 4.7, users of IBM's VSE/SP, the newer VSE operating system, will also be supported.

The software package is said to allow users to gradually move to the MVS environment. With Release 4.7, for example, users can execute a VSE program in an MVS environment.

The software package allows users to run a sort under MVS with VSE sort exit routines instead of rewriting those exit routines as MVS exit routines, the company said.

In addition, Computer Associates said, CA-Duo includes facilities that upgrade the performance of VSE programs as well as providing direct access to MVS facilities from within a VSE program.

CA-Duo Release 4.7 is available now. It carries a two-year license fee of $40,000. Current users of Release 4.6 who have maintenance contracts can upgrade free of charge, Computer Associates said.



SAA goals

CONTINUED FROM PAGE 21

much better at driving 1,000 users than five, Friedline said.

But MVS and other mainframe operating systems are no longer the only choices, he added, as witnessed by the "placement of 15 million personal computers over the past five years."

The mask

The purpose of the common programming interface of SAA is "to mask the differences of those operating systems" and still allow a developer to build applications.

Another part of SAA is a common user interface, so the user sees the same thing whether the application is on an IBM Personal Computer or "System/3X" — the follow-on to the System/36 and 38 code-named Silverlake.

"What is key over the next five years is to get access to end users, to drive production with application tools that should look the same and feel the same if they access different systems," Friedline said. "You want that done at the highest level possible, because life is too short for all of us to become application programmers."

No cure-all

SAA, however, is not a panacea for application developers. "What's critical is it still requires structured programming techniques. You must design applications for portability," the Atlanta-based marketing manager said.

One example is CICS Cobol applications. IBM has on plans to move its CICS teleprocessing monitor to smaller hardware platforms, such as PCs, because it does not make sense on single-user machines. That means a CICS Cobol program must be structured in such a way that the CICS Command Level statements are easily separated from the Cobol statements for it to be portable, Friedline noted.

He added that IBM is committed to moving its application development system, Cross System Product (CSP), into the IMS environment. CSP was previously limited to CICS and TSO under MVS and to CMS under VM.

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Gilliam

CONTINUED FROM PAGE 21

leaves out a very vital part of the productivity effort — the tools used in the work process. Therefore, the costs should include computer costs as well as any other funds expended to support the design and creation of the application.

The developers and users of the function point approach contend that the technique is just not precise enough right now to measure a single program or the person who produced it. They do believe, however, that the idea is appropriate for measuring total applications. And by combining such data, the relative productivity of a development team or group could be measured.

Measuring MIS

Perhaps the productivity of a support group could also be measured. This might be done by first knowing the sum of function points for all applications being supported. Then the productivity of the support group is determined by dividing the function point total by manpower time and/or total costs. These figures could then be used for comparing and charting the trend of time and costs per, say, 1,000 function points supported. Other broad measures of all MIS activities are being developed in conjunction with the function point development work.

Having some type of uniform measurement of applications, along with the costs of producing those applications, provides valuable information to the MIS manager. For example, applications could be compared to point out the "above average" or "below average" systems. Then those factors that contributed to the productivity — or lack thereof — could be found and evaluated. Trends in productivity could be charted and used in measuring benefits of new tools like fourth-generation products.

Could function points someday become a universal standard in the measurement of a computer application system or its creators? Perhaps, if the method's evolution is supported and allowed to move toward greater usefulness and acceptability.

If the technique were to become an industry standard, could the MIS department be compared with other similar units within or outside the corporation?

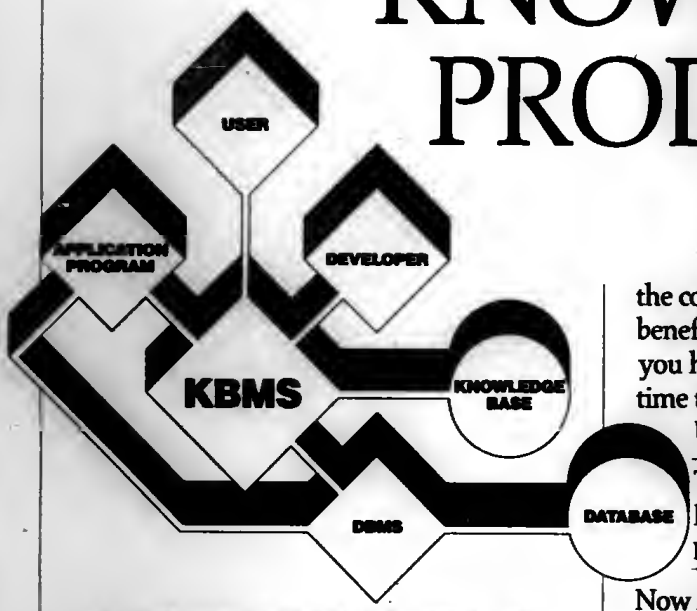
What should an MIS organization do to take advantage of these ideas? Someone in the organization should be assigned the responsibility of tracking the progress made in the application of function points and other "software metric" concepts. Next, there must be a resource cost allocation system in use that captures and allocates man-hours, machine time and all costs down to the project, or applications, level. Service agreements should also be implemented.

Then, begin measuring the function points in all new applications in order to establish a routine for measuring and to begin creating the historical data base.

The most important step is to start. Then a learning and adjustment process on which to build can be set in motion. Those who make such a commitment early will likely be the first to reap the benefits of measuring and improving the productivity of the MIS unit.

Gilliam is president of Gilliam Associates, a management consulting firm in Ponca City, Okla.

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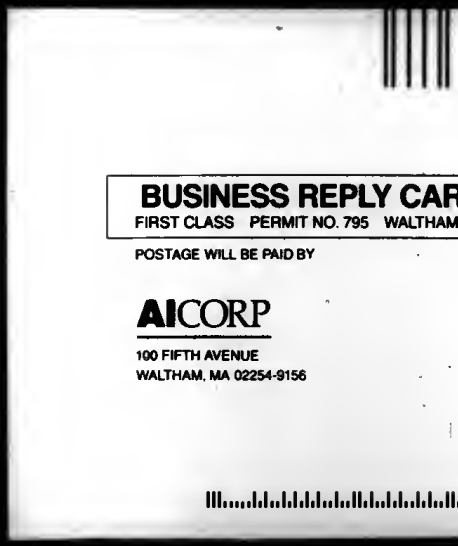
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NEW PRODUCTS

Systems software

An on-line, real-time system providing immediate transaction processing and full security for multilocation, multifacility health care institutions has been announced by **Global Software, Inc.**

Called **Hospital Material Management System**, or HMMS, the program was designed for use in the purchasing, disbursement and replenishment of stock and nonstock items. Features include automatic requisition consolidation, usage analysis capabilities, vendor performance reporting and real-time stock status checking.

HMMS runs on IBM 4300, 3000 and 9370 series computers and IBM System/38s and compatibles. It is priced from $90,000.

Global, 1009 Spring Forest Road, Raleigh, N.C. 27615. 800-334-7192.

Unisys Corp. has announced an integrated on-line, real-time financial management and accounting system based on its Linc fourth-generation language.

Executive Linc runs on Unisys A and V series mainframes. The modules include General Ledger, Accounts Payable, Accounts Receivable, Fixed Assets, Purchasing Order Processing, Inventory Control, Order Entry and Payroll.

Prices range from $10,000 to $36,000 per module, depending on the CPU.

Unisys also announced **DMS. View** and **Linc. View**, products for use with its Infoexec series of data management facilities and Linc II on the A series systems.

DMS. View allows A series users to access Infoexec's Interactive Query Facility and Workstation Query Facility without migrating their data bases. Linc. View offers the same capabilities for Linc II data bases.

DMS. View is included in the Infoexec series. A five-year license for Linc. View ranges in price from $4,000 to $119,000.

Unisys, P.O. Box 500, Blue Bell, Pa. 19424. 313-972-9515.

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PACKET/3270 is a trademark of PACKET/PC, Inc

Utilities

A product said to allow users of IBM's Interactive Computing Control Facility (ICCF) to execute most user transactions directly from an ICCF command mode or full-screen edit-mode command line has been announced by **Dynamic Products, Inc.**

Called **DPIICCF**, the utility allows users to define transactions to be made available from ICCF in a table used by DPIICCF. Then users enter the tranid on the command line of a command mode of full-screen edit-mode screen. When the transaction is terminated, control returns to ICCF at the exact point where it was before exiting to the user transaction, the vendor said.

DPIICCF costs $80 per month, $800 per year or $2,400 for a permanent license.

Dynamic Products, 1782 Richard Circle, St. Paul, Minn. 55118. 612-451-3051.

Software designed to provide data compression under IBM's MVS and MVS/XA operating systems has been introduced by **Sterling Software, Inc.'s** Systems Software Marketing Division.

Shrink/IMS Express is transparent to application programs, the vendor said, and uses no tables. It also includes an IBM ISPF interface and requires a minimum of system overhead, so other jobs can be run simultaneously.

Shrink/IMS Express costs $19,000 for a site license.

Sterling Software, #100, 11050 White Rock Road, Rancho Cordova, Calif. 95670. 916-635-5535.

A spool-file management system for Hewlett-Packard Co. business computers running its MPE XL operating system has been introduced by **Unison Software.**

Spoolmate features preprint analysis, distribution control and multilevel priority queuing.

Also included are an on-line printing history for any printer and spool file, spool-file archiving in either the MPE spooler or a permanent disk and an audit trail to determine the status of a single spool file or a group of spool files.

Spoolmate is priced between $1,500 and $4,000.

Unison Software, 415 Clyde Ave., Mountain View, Calif. 94043. 415-968-7511.

Development tools

Software designed to extend full embedded SQL support to the IBM interpretive TSO Clist language has been released by **Relational Architects, Inc.**

RLX/DS allows development of Clist combining ISPF dialogue services with embedded SQL. RLX Clist dialogues can be edited and tested within ISPF/PDF Edit. According to the vendor, no compile and link edit steps are required.

RLX/DS adheres to standard syntax, enabling RLX SQL statements to be copied directly into Cobol or PL/I. Support is provided for nulls and host indicator variables, and SQL query results can be stored directly in ISPF tables.

RLX/DS costs $12,000. Annual rental is $4,000.

Relational Architects, Suite 2341, 175 Fifth Ave., New York, N.Y. 10010. 212-966-0010.

MICROCOMPUTING

MICRO BITS

Douglas Barney

Criticism overblown?



Still arrogant after all these years? Several years ago, it was popular to characterize Lotus as arrogant.

The firm was the clear spreadsheet chieftain, had grown far more quickly than its support and sales staff could handle, clung tightly to copy protection and was bashed consistently by customers, competitors and the press.

Recently, Forrester Research reopened the topic by publishing a report that says Lotus customers love the products but hate the company. The report, based on interviews with a scant 34 customers, indicates that 56% of Lotus's customers find the firm "responsive to their service and support needs," but apparently 44% didn't.

But while a *Computerworld* survey of users failed to give Lotus an unqualified pat on the back [Nov. 2, 1987], the firm did get a healthy B for customer support. As for customer relations, Lotus got a C+ and praise for its efforts to improve.

Where does that leave Multimate, Framework and

Continued on page 31

Shift in Oracle OS/2

Rewriting pushes ship date back to April

BY NELL MARGOLIS
CW STAFF

BELMONT, Calif. — It seems rarely a week goes by that Oracle Corp. fails to make some sort of announcement. Last week was no exception.

In some ways, it was a reannouncement of the firm's Microsoft Corp. MS OS/2-based version of Oracle. Originally, the firm planned to do a simple port of Oracle to the OS/2 environment and ship it concurrently with the operating system.

Instead, Oracle chose to rewrite the product to take advantage of OS/2 features not attainable in a simple port, pushing back the delivery schedule.

Now slated for shipment in April, Oracle for OS/2 takes advantage of OS/2's multitasking and shared-memory features. The product gives users a server-based architecture geared to "the maximum overlap of computation and I/O," a company spokesman said.

The OS/2 product may be a critical weapon in Oracle's battle with the recently announced but still unshipped Ashton-Tate Corp./Microsoft/Sybase, Inc. SQL Server. "Oracle for OS/2 should give Oracle a competitive position against SQL Server," argued Michael Cohn, an analyst with Input, a market research firm based in Mountain View, Calif.

The latest Oracle — which can be used simultaneously as a stand-alone single-user system and a data base server to a multiuser network — is powered by

Continued on page 35

Data View

Off and running

Percent of micros using OS/2 expected to skyrocket by 1991



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Visicorp founder rejoins the spreadsheet fray

BY DOUGLAS BARNEY
CW STAFF

SAN FRANCISCO — The founder of ex-spreadsheet king Visicorp has reentered the rows and columns market with a line of add-in products for Lotus Development Corp.'s 1-2-3.

Dan Fylstra, who served as chairman of Visicorp until November 1984, last week announced three 1-2-3 add-ins aimed at boosting the speed of calculations and providing project management and decision support.

As the marketing agent for Visicalc, Visicorp once ruled the spreadsheet roost. However, a protracted legal struggle with Visicalc supplier Software Arts, Inc. concerning product enhancement issues gave Lotus an easy entre into the market. Visicorp was then sold to Paladin Software Corp., which itself folded.

In addition to supporting the product that helped destroy Visicorp, Fylstra's new firm, Frontline Systems, Inc., also plans to support other major applications, such as Borland International's Quattro.

Continued on page 30

DOS 32-bit package an OS/2 bridge

BY ALAN J. RYAN
CW STAFF

CUPERTINO, Calif. — Opus Systems is now shipping a coprocessor board and software package for personal computer users wanting to run 32-bit Unix-based applications from the Microsoft Corp. MS-DOS environment.

Typical applications for the Wizard of OS include computer-aided engineering, computer-aided design and manufacturing, and computer-aided software engineering. The product is viewed by some as an interim solution to problems that IBM and Microsoft's OS/2 ultimately are meant to solve.

"While users in the past have been able to take advantage of 32-bit multitasking applications on their PCs, they have never been able to do so while remaining in the pure DOS environment until now," said Robert DeHaven, Opus's vice-president of sales and marketing.

Continued on page 33

Inside

- Gupta's SQL server mastermind speaks out. Page 29.
- Tool aims to put mainframers out of business. Page 29.
- Program diagnoses optical drives as hard disks. Page 30.

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C&C Computers and Communications

SMALL TALK

Julie Pitta

Dulcet tones or tin ear?

With the debut of Modern Jazz, Lotus has attempted to bring some harmony to what has been a dissonant relationship with Apple.

Lotus's original Jazz, an integrated business package for Apple's Macintosh, was introduced more than three years ago amid much fanfare. Even then, Apple had its eye on the elusive business user it hoped to reach with applications like Jazz.

Apple was in for a disappointment, as Jazz became one of Lotus's more prominent flops. The package was bug-ridden, lacked a macro programming language and, at $595, was considered overpriced. Although about 50,000 copies of Jazz were delivered during its first year on the market, according to Dataquest, shipments plunged to 10,000 in 1986.

In comparison, Microsoft delivered 15,000 copies of its Mac spreadsheet, Excel, which shipped later that year. Shipments of Excel jumped to 160,000 copies in 1986, according to Dataquest.

Lotus's failure with Jazz caused the software giant to reconsider its Mac development efforts. Why then, did Lotus choose to reenter the Mac market with a name that is less than music to the ears of Mac users?

"It's one of those questions that you can argue on its behalf or against it and still be right," says Kathy Lane, an industry analyst at Dataquest.

There were many such arguments at Lotus headquarters before the firm's marketing

Continued on page 33

The ace behind Gupta's PC servers sees lots of topspin coming in SQL market

While many software developers scramble to get a relational microcomputer data base server on the market, Gupta Technologies, Inc. has been selling an IBM PC-DOS version of such a product since October 1986. The technology used in SQLbase was advanced enough to attract the attention of Lotus Development Corp., which will announce this week that it has been developing a similar server with Gupta for nearly the past two years. That server is expected to tie into an upcoming front-end data base application from Lotus.



Umang Gupta strives to gain edge in PC server market

The mastermind of the company's SQL server technology is Umang Gupta, an Indian immigrant who founded the Menlo Park, Calif.-based developer three years ago. Unlike other data base servers that are being ported from minicomputer and mainframe environments today, Gupta built his technology from the ground up for personal computers. That PC-based technology may well give Gupta an edge in the emerging PC server market as competition starts to heat up.

Although Gupta could not talk about the pending Lotus announcement during a recent interview with West Coast correspondent Stephen Jones, he did discuss the explosion of interest in data base servers and some of the nuances of the expanding market.

Why has there been such increased interest in SQL for personal computers?

There was a need for some protocol or language to separate front-end applications from back-end servers. SQL happened to be there, and it made possible concepts like data base server technology and cooperative processing technology. SQL originally proved to be a relational data base management system language for programming and ad hoc query and analysis, but it was inevitable that SQL was going to become a standard. IBM's announcement of OS/2 Extended Edition was the last thing needed to get it there.

How will the move to PCs affect the market for host data bases?

I don't think it will reduce the market; there will continue to be a market for data bases to exist on host mainframes and minis. It's possible that the emergence of local-area network data bases will reduce the growth in the mini area for data bases, but overall, there should be growth in all three areas.

What do you think about the SQL Server announcement by Ashton-Tate Corp. and Microsoft Corp.?

The relationship between the companies is a good one. They all

Continued on page 35

Theos 386 version eagerly awaited

BY ALAN J. RYAN
CW STAFF

Although Theos 286 sites are already taking advantage of multitasking and multiuser capabilities not found in Microsoft Corp.'s MS-DOS, users are eagerly awaiting its 32-bit Theos 386 counterpart, which will be faster and use the additional functionality of Intel Corp.'s 80386 processor. They will not have to wait long.

Last week, an international developers' conference was held in Lafayette, Calif., to unveil Theos Software Corp.'s Theos 386 and its companion Theos C language. Some 60 developers in attendance received beta development kits and training on the

Theos 286-V

Price: Price: $695 for runtime version for one to 32 users

- Requires 640K bytes of memory; supports up to 16M bytes

Supports: Theos Basic, Theos C, Exec Job Control Language, Ryan/McFarland Cobol

Theos 386

Price: Unannounced

- Supports one to 128 users
- Requires 1M byte of memory; supports up to 4G bytes
- Supports Theos Basic, Theos C, Exec Job Control Language

operating system. The new version should be out in the second quarter, a company spokesman said.

Theos 386 will support up to 128 users, each with 4G bytes of addressable memory, the company claimed. The large memory address breaks the 640K-byte program segmentation barrier for C programs.

For current users of the Theos 286 operating system, the migration will be a natural one, they said.

Speed needs

Elon Bateman, president of Shoreman Food Technologies, Inc. in Federalsburg, Md., said it all comes down to speed. "I never thought systems were fast enough, but we're at the point now where they are becoming fast enough for our needs," he said.

Bateman is currently running Theos 286 on a Third Coast Technologies, Inc. 386-based computer with 10 terminals, six printers and a modem hitched up to it. He said he plans to purchase Theos 386 when it is available.

Shoreman, which manufactures dehydrated bread for stuffings and coatings, is using Theos to handle its accounting, sales, inventory, payables, receivables and quality control testing, Bateman said.

John Hobach, an applications programmer at the J. C. Penney Co. catalog division in Milwaukee, said his future plans include Theos 386. "The biggest advan-

Continued on page 30

Don't tell Willard Scott about this one

BY DOUGLAS BARNEY
CW STAFF

HARTFORD, Conn. — If you want to know what the weather will be in Yuma, Arizona, tomorrow or how cold it was yesterday in Fairbanks, Alaska, just ask your computer. At least, that's what Metacomet Software, Inc. hopes users will do.

Metacomet recently completed Accu-Weather Forecaster, a software package that can import and analyze live weather data from the Accu-Weather, Inc. weather service. The data includes air pressure, fog, rain, wind direction and speed and steering winds — which exist at some 18,000 feet and help determine the direction weather systems take.

While aimed in part at the hobbyist market, the package is also applicable to any business that depends on the weather. These businesses include agriculture, amusement parks, transportation firms and ski areas, all of which make business decisions based on often out-of-date weather forecasts.

Metacomet is also pitching the product to on-the-go executives to assist in travel planning. The package is not intended for businesses such as large airports, which already have trained meteorologists on staff.

Small insurance firms hoping to predict potential damages from storms are also a target of the product. But like major airports, most large insurance firms employ meteorologists and can predict storm damages before a storm even occurs.

When using Accu-Weather Forecaster, users log on to the

Continued on page 30

Top sellers

Software: Feb. 15-19



INFORMATION PROVIDED BY CORPORATE SOFTWARE, INC.
CW CHART

Theos 386

CONTINUED FROM PAGE 29

tage of Theos 386 over the 286 is unlimited memory usage for developing," he said. Hobach writes nearly all of the software used to automate the catalog division.

Archive headache

One drawback in the system, according to Shoreman's Bateman, is its inability to do live archiving. "My plant runs 24 hours a day," Bateman said. "When I shut the system off to do an archive, somebody takes a hit."

Bateman also said the operating system cannot boast a wide breadth of add-on third-party software.

The users said there are no licensing problems using the multiuser capabilities on the Theos system. "You just buy a version of the application software for the correct number of users," said Michael Ackerman, manager of support services at the San Francisco Chamber of Commerce.

Ackerman said the Chamber recently purchased a Third Coast Technologies 386-based computer to run Theos 286. The unit was configured with 25 serial ports.

"We plan on putting 13 users on it off the bat, and we'll increase that to 19 in April," Ackerman said. He added that he will upgrade to the Theos 386 as soon as he can.

The users agreed that Theos 286 is cost-effective for their needs.

"I could get another user up and running for maybe another $600 — the cost of a terminal and a cable," Shoreman's Bateman said. "If I put another IBM PC on the line, by the time I get the network cards and software in place, I'm going to spend some serious money."

Visicorp founder

CONTINUED FROM PAGE 27

The $125 3-2-1 Blastoff is a spreadsheet formula compiler that speeds the recalculation of Lotus work sheets by five to 10 times.

Unlike other spreadsheet compilers, which allow work sheets to he distributed and read without 1-2-3, the Frontline Systems product is aimed solely at performance.

Faster than Speed-Up

The system includes the minimal recalc feature found in the Lotus Speed-Up utility. With minimal recalc, only the cells that have been changed are recalculated.

However, 3-2-1 Blastoff goes further to speed the calculations by compiling 1-2-3 formulas into machine instructions for Intel Corp.'a 8087, 80287 and 80387 math coprocessors. As a result, 3-2-1 Blastoff requries a math coprocessor, the developer said. "Blastoff speeds up recalcs. Speed-Up avoids recalcs," Fylstra added.

For the distribution of "secure" work sheets, 3-2-1 Blastoff allows the user to delete the formulas used to build a work sheet. As a result, the recipient can load the work sheet but cannot modify the formulas. The project is set to ship next month.

Project packages

Frontline Systems also introduced the $145 Project Calc, which is aimed at managers of moderate-size projects. With Project Calc, Frontline Systems said specific budgets and schedules can he created with the same spreadsheet used for overall budgeting.

A project schedule can also he linked to a spreadsheet so that any change to the spreadsheet will trigger a change in the schedule. The package is said to he able to generate Pert and Gantt charts and perform critical path analysis. It is scheduled to ship in April,

The third product provides decision trees that are linked to 1-2-3 work sheets. The $100 Decision Analyst, also slated to ship in April, was written by Fylstra and tests many "what-if" alternatives.

Willard Scott

CONTINUED FROM PAGE 29

Accu-Weather service at 1,200 bit/sec. and download specifically requested information.

User controls weather

The software can map the data, allowing the user to make the forecast. Accu-Weather also provides premade Accu-Weather forecasts, but these are not as up to date as forecasts made with the live data. Although the package does not automate the weather forecasting, it does include a primer on forecasting based on weather data and mapping.

Now a commercial product, the software was orginally written to assist gifted students in the Hartford school system do weather forecasting, according to the students' teacher, Daniel Barstow, who is also the program's author and president of Metacomet.

The $90 package currently runs on IBM Personal Computers and compatibles and requires a modem. A version for Apple Computer, Inc.'a Macintosh is slated to be available next month. In addition, a version for the Apple II is in the works and will reportedly he available in six months.

There is no subscription fee for Accu-Weather data. Users pay an hourly charge for connecting to Accu-Weather, and a typical fee for downloading would he $2, Barstow said.

In 1987 Microsoft put over 2,100,000 hours into research and development to introduce 21 new products and product updates.

The work is hard.

Barney

CONTINUED FROM PAGE 27

Dbase IV? When Ashton-Tate chairman Ed Esber told the media that his firm's Presentation Manager products will be based on its line of Apple Macintosh software, an interesting question emerged: Does this mean the firm's current core offerings in Microsoft MS-DOS word processing, integrated spreadsheet and data base are now little more than chopped liver?

Betaware umbrage. Marty Rinehart of Wallsoft Systems recently called to point out a grievous error in a recent column that dubbed his firm the latest entrant into the betaware market. (Betaware is unfinished software that is sold to customers.)

Rinehart is seeking honors for being the true pioneer of betaware. As a matter of fact, Wallsoft's UI2 code generator for Dbase was the first betaware ever, Rinehart says. That is, unless you count extremely buggy shrink-wrapped software that is sometimes passed off as finished product.

Rinehart also quarreled with our definition of betaware as users getting to pay for debugging a vendor's software. Rinehart says customers (especially programmers) are happy to get cracking on a key program early. And whereas most beta-test software goes out to key customers, betaware is available to anyone as a kind of egalitarian beta test.

HEADHUNTERS at Uniforum 1988 set up tables filled with such programming tools as Jolt Cola, Oreo cookies and Twinkies.

But do you need a multitasking lap? By this summer, users will be able to take OS/2 on the road when they use a Toshiba America high-end laptop. Later, Toshiba will provide the Presentation Manager graphical user interface. Now if they could just find a place to hang the mouse.

I cannot tell a lie. Most vendors displaying OS/2 applications at Compaq's MS OS/2 announcement recently said their products took months to develop because they weren't just ports of existing products. But Spencer Leyton, vice-president of Symantec, claimed his company's Living Videotext Division needed just 48 hours to come up with its OS/2 version of Thinktank 2.41., an outline processor with desktop productivity features. "And I think that's because we let the programmer go home in between," he quipped.

An offer you can't refuse. Knowing what kind of people program in Unix, headhunters at the recent Uniforum 1988 show came prepared. They set up tables filled with such programming tools as Jolt Cola, Oreo cookies and Twinkies. Stamped onto the Twinkies wrapper was the headhunters' phone number.

Nobody can have just one 386 computer chip. Speed-demons may want to look out for samples of 25-MHz Intel 80386s, set to ship sometime in the second quarter, with production level quantities appearing in the fourth quarter. But don't hold your breath for the 32-MHz model, which probably won't be announced this year. As for the 80486, sorry to say you're looking at late 1989.

It is still a young industry. David S (no punctuation) Schulhof may be destined to follow in the footsteps of such innocents as Microsoft founder Bill Gates and Dell Computer founder Michael Dell, who each made a fortune in the computer business before they were 30. Schulhof, age 22, is the founder of Complete Computer Services, Inc., which recently sold its 25,000th copy of CCS Designer computer-aided design software.

Of course, Schulhof depends on the wise advice of older executives, such as Vice-President of Marketing Suzanne K. Arlie, who is 24, and Vice-President of Operations Cheryl Meder, who at 29 must be nearing early retirement.

Care to buy an old fogy a beer, Dave?

Don't forget to bring a camera: To show its appreciation for the gobs of money it has made in that country, Lotus will, for the first time, hold its board meeting in Japan in a few weeks.

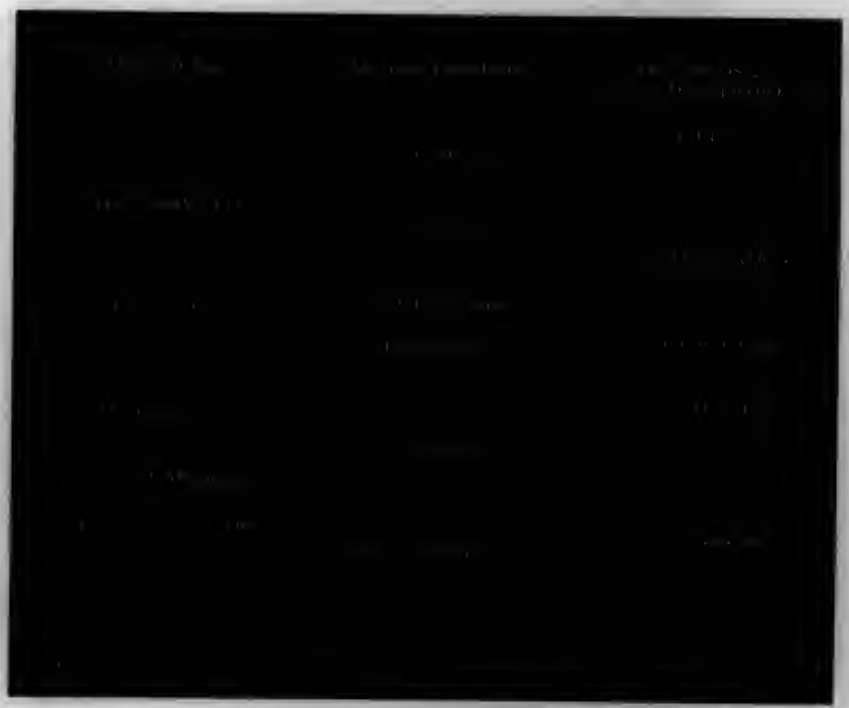
Computerland branches out into market forecasting. I guess if you sell millions of dollars worth of computer products from 550 stores every year, you should be in a position to know what areas of the market are going to heat up. Well, Computerland agrees and recently released a paper on three hot areas for this year.

Topping the list are personal computer networks and the advent of "network-able software." So, 1988 is finally the year of the LAN?

Also on the list are desktop presentation systems that allow a PC to create slides and overhead transparencies. These systems will use laser printers, photo scanners and photo digitizers to allow photographs to be combined with text.

Barney is a Computerworld senior editor, microcomputing.

The rewards are many.



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PS/2 adapter leaps 7M bytes

BIRMINGHAM, Mich. — Hoping to be the first to exploit IBM OS/2's thirst for memory, Profit Systems, Inc. has announced a product that it said breaks the 7M-byte random-access memory barrier on the IBM Personal System/2 Model 50.

The Elite 16/2, a 16M-byte universal RAM adapter, works with PS/2 Models 50 and 60 and the 16-bit slots in Model 80s. It breaks the 2M byte/slot barrier with its proprietary Unirom, the company said. OS/2 reportedly boots up and recognizes all Elite 16/2 usable memory without the use of device drivers.

The product supports IBM's PC-DOS and Microsoft Corp.'s MS-DOS, multiuser operating systems like Unix and Xenix, local-area network operating systems and Quarterdeck Office Systems' Desqview. Shipments will begin within the next few weeks, according to a company spokeswoman.

The product ships with 512K bytes of memory for $595. Additional memory upgrade kits cost $200 for 512K bytes and $1,000 for 2M bytes.

OS/2 bridge

CONTINUED FROM PAGE 27

For the Futurenet Corp. division of Redmond, Wash.-based Data I/O Corp., the Opus product is necessary to allow the company's Future Designer software to run under MS-DOS. Futurenet is also an OEM for some of the Opus products.

Michael McClure, marketing product line manager at Futurenet, said that while the Wizard of OS board will be transparent to users, many are leery of adding boards to their PCs. "Some think it is a boat anchor, because many applications don't need it," he said. "It won't speed up your word processor or your Lotus [programs]. It will only speed up those applications that the vendor has ported to it. We use it because we cannot make our product run under standard DOS under 640K bytes of RAM."

When OS/2 becomes readily available, the need for the Wizard of OS board will be even more limited, McClure predicted. "There are advantages to Unix that some people want," he said. "I will probably end up offering both OS/2 and Unix versions and let the customer decide."

The Wizard of OS consists of a coprocessor board offering performance of 1 to 5 million instructions per second, 2M to 16M bytes of random-access memory and a single floppy disk.

The disk contains software that includes a Wizard of OS kernel, which runs on the Wizard of OS coprocessor board and is similar in function to the Unix kernel, and the Wizard of OS agent, which runs in DOS or OS/2 and translates Unix calls to MS-DOS or OS/2 calls. Wizard of OS also uses a DOS file system and DOS or OS/2 devices.

The Wizard of OS runs on IBM Personal Computers, PC ATs, XTs and compatibles. An OS/2 version will be available in April, the company said. It also supports AT&T Unix System V, Release 3 system calls, the company claimed. Prices range from $1,995 to $7,640.

Pitta

CONTINUED FROM PAGE 29

group settled on a name for the upgraded version of Jazz. Lotus began previewing the product under the name Galaxy nearly one year ago, a name that was selected because a member of the product team is an amateur astronomer.

Galaxy might have remained the product's official name had it not already been taken, according to Kim Shah, Lotus business development manager. "Everyone wanted to keep it," Shah says. "But it would have been difficult to use it here and impossible to use it abroad."

Back to the drawing board. During a one-year period, Lotus held four brainstorming sessions that generated 600 potential product names. Brainstorming groups consisted of Lotus employees both involved and not involved with the Jazz project.

Stuck on Jazz

Pam Campagna, Modern Jazz product manager, says names tended to revolve around interwoven and multifaceted themes reflecting the product's integrated nature. "Coming up with a name is the easy part," Campagna explains. "The hard part is being able to use it."

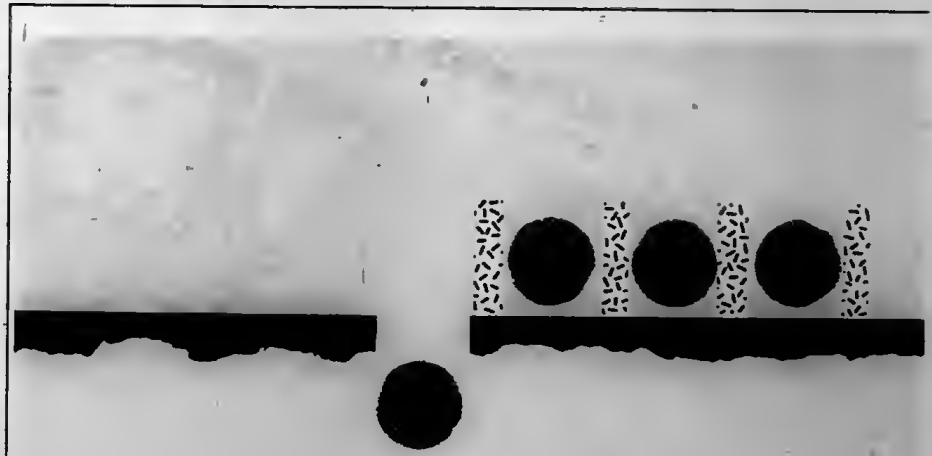
Despite Lotus's efforts to rename the product, Jazz stuck.

"We talked with a lot of end users and retailers about the name, and the one thing that came out loud and clear was that no matter what we named it, people would associate the product with Jazz," Campagna maintains. "We decided that we could spend time explaining to people why we renamed the product or be able to get beyond that and tell people what it does.

"Besides, it's descriptive of the product, and it's got a nice ring to it," she adds.

Modern Jazz isn't the first time that a naming project hasn't borne fruit. Before the original Jazz was launched, Lotus launched an in-house contest to come up with a name. No prize was awarded, since Lotus President Jim Manzi opted to name the product himself.

Pitta is *Computerworld*'s West Coast senior correspondent.



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Gupta ace

CONTINUED FROM PAGE 29

needed each other to some point. But I believe it's too much to expect that one server will become the dominant standard. There are too many competing forces out there to allow one company to deliver a knockout blow to all the other vendors in the business. SQL Server will be one of four or five products that will be competing in the market.

Remember that squeezing a mini [server] system down to PCs is not just a matter of porting it over. There are many things they have to solve to meet performance and portability considerations, and certain utilities on the mini version may be quite different than the ones you have in a PC environment.

Do you think Ashton-Tate is giving up on the back end of the data base market?

No, if it was a choice of having the Microsoft back end or on back end at all, then it was a good move for the short term. But in the long term, a back-end engine is too important a component for a major data base company to give up the control of such important technology to somebody else. I believe Ashton-Tate will eventually come out with a server system of its own that will give it more control over the technology.

Do you see Ashton-Tate's Dbase as an important front end to a server?

I think it's hard to graft something like Dbase onto SQL; I'm skeptical about somebody's ability to build a product that truly supports SQL and can also support programs from earlier [Dbase] versions.

Does Gupta have a head start in the the SQL server market because you already have a Microsoft Corp. MS-DOS version of the product?

We have a head start to the extent that we have a product out there, but the eventual success of our company will be how we market not just SQL Base/16M, a server product that uses expanded memory, but how we market all products in terms of things like connectivity. We're staking our future on the success of cooperative processing, not just SQL back-end engines.

Microsoft is positioning SQL Server as systems software, but should a DBMS be labeled as systems software?

It would be nice if that were so. IBM is also labeling its OS/2 Extended Edition as systems software. But until we achieve a standard programmatic interface for back-end engines, it will be hard to think of them as just another component of systems software. I believe that should happen, but it won't happen overnight.

Other than a data base, what are the most appropriate application front ends for a back-end server?

In addition to traditional front-end data base tools, a spreadsheet is a natural to be put in front of a data base engine. Also, there are applications such as document processing, page composition and word processing and even expert systems.

Oracle shift

CONTINUED FROM PAGE 27

an SQL-based data base kernel composed of four concurrent OS/2 processes, the spokesman said.

These four processes include one that writes to the data base file and the after-image journal file; one that manages all before-image I/O, providing data integrity to users doing simultaneous updates and deletes; one that increases throughput by anticipating the need for data blocks; and one that provides a significant measure of data integrity and safety by rolling back partially completed or prematurely terminated transactions.

In addition, a shadow process spawned by the kernel prevents users from corrupting a shared data base by inadvertently writing to shared memory. When applications are executed across a network, the application communicates with its shadow on the remote Oracle OS/2 server by means of major industry protocols.

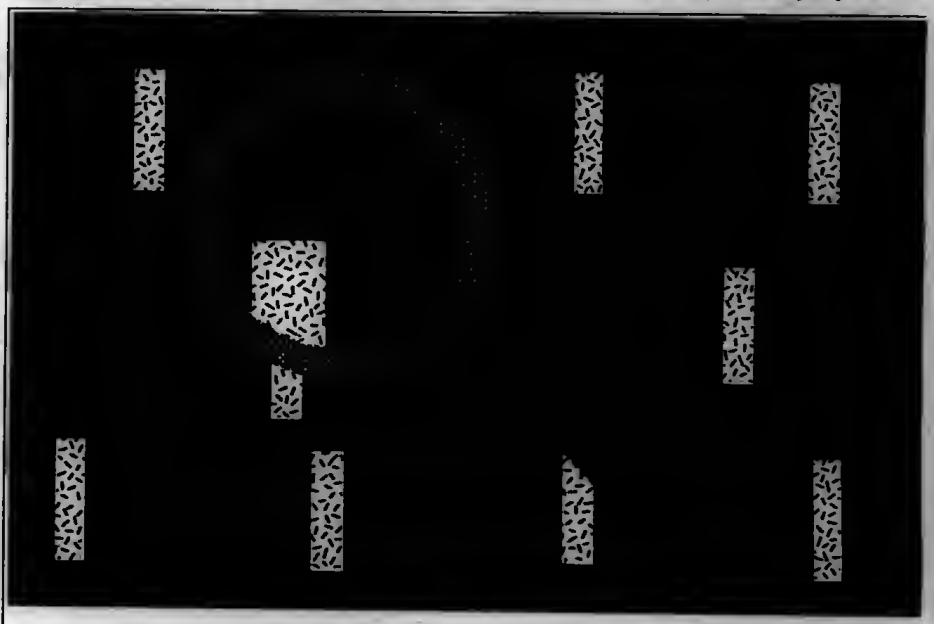
The Oracle OS/2 package comes with a network management tool for data base administrators. Dubbed Oracle Display System, the software lets the administrator monitor data base use in real-time on an OS/2 server.

Nothing new

The product's architecture, according to an Oracle spokeswoman, "is not completely new under the sun. This is substantially the same architecture we introduced back in April, when we announced Professional Oracle and the Oracle Lanserver, and that underlies all of Oracle."

The difference between Oracle for OS/2 and the substantially similar Lanserver is a critical one, overlooked in much of the publicity attending last spring's Laneserver announcement, the spokeswoman said. Lanserver runs only under Xenix. The Oracle Lanserver went to beta-test sites in November. The virtually identical underlying architecture, the spokeswoman said, will make porting from Microsoft MS-DOS-based Professional Oracle to Oracle for OS/2 considerably easier to accomplish.

While final prices have yet to be set, Oracle said it anticipates marketing Oracle for OS/2 at Professional Oracle's $1,295 price.



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NEW PRODUCTS

Data storage

A software program that links write-once optical storage drives manufactured by ATG Corp. or Optimen Corp. with IBM Personal Computers and compatibles has been announced by **Optical Storage Solutions, Inc.**

Called **Perma File**, the program makes an optical disk drive appear as if it were a hard disk. It can address storage capacities of up to two billion bytes while managing 95,000 files. Five files may be open simultaneously for reading and one file at a time for writing.

Perma File costs $895.

Optical Storage Solutions, 1130 D Burnett Ave., Concord, Calif. 94520. 415-825-3441.

A 5¼-in. external floppy disk drive for the IBM Personal System/2 series has been announced by **Delkin Devices U.S.A.**

The **525 Extra** plugs into an existing connector inside the PS/2. It acts as a B drive, allowing the systems to read, write and format standard 360K-byte disks. The drive does not contain a power supply. It uses power from the computer's own internal supply.

The 525 Extra is priced at $325.

Delkin Devices, Suite 306, 4655 Cass St., San Diego, Calif. 92109. 619-273-8086.

Emerald Systems Corp. has combined its 150M-byte enhanced small device interface hard disk and its 150M-byte quarter-inch cartridge tape into a tape backup subsystem called the **DOS 150-4000**.

The unit operates under the DOS operating system and most DOS-based local-area networks. It offers disk access times up to 16.5 msec with backup speeds to 5M byte/min on the tape drive.

According to the vendor, if used with an existing hard drive, the DOS 150-4000 uses Emerald Systems' optional Diskmeld feature, allowing it to meld the two hard drives into one logical volume.

The DOS 150-4000 is priced at $5,995.

Emerald Systems, 4757 Morena Blvd., San Diego, Calif. 92117. 619-270-1994.

A 5¼-in. optical disk drive said to be compatible with magnetic drives has been introduced by **Laserdrive Ltd.**

The **Laserbank 800** is said to be capable of running application software and operating systems developed for Winchester drives without modification. According to the vendor, it can also be used like a magnetic storage device. It features 810M bytes of storage capacity, an access time of 175 msec and data transfer rates to 2.78M bit/sec.

In addition to Winchester mode, in which the Laserbank 800 reads, writes and appears erasable to the user, the drive also supports write-once read-many mode.

A single-drive Laserbank 800 subsystem costs $4,995. A double-sided optical cartridge that is compatible with the IBM Personal Computer AT costs $189.

Laserdrive, 1101 Space Park Drive, Santa Clara, Calif. 95054. 408-970-3600.

Board-level devices

A small computer systems interface adapter for the IBM Personal System/2 series has been announced by **Future Domain Corp.**

The **MCS-350 Host Adapter** interfaces with the PS/2 Models 50, 60 and 80. It offers a transfer rate of 1.67M byte/sec. as well as full Micro Channel compatibility with IBM-assigned identification numbers, the vendor said. It can run such operating systems as 's Xenix and IBM and Microsoft Corp.'s OS/2.

The MCS-350 Host Adapter is priced at $390.

Future Domain, Suite A, 1582 Parkway Loop, Tustin, Calif. 92680. 714-259-0400.

PC Technologies, Inc. has introduced two half-slot accelerator cards for the IBM Personal Computer.

The **286 Express-12** and the **286 Express-16** have 12- and 16-MHz Intel Corp. 80286 microprocessors, respectively. They each have 16K bytes of cache memory to speed up Intel 8088-based personal computers that operate at clock speeds of 4.77 to 8 MHz.

The 286 Express-12 costs $645, and the 286 Express-16 costs $795.

PC Technologies, Box 2090, 704 Airport Blvd., Ann Arbor, Mich. 48106. 313-996-9690.

The **Cadcontroller**, a multifunction graphics card, has been introduced by **GTCO Corp.**

The IBM Personal Computer AT-size card is said to be capable of displaying 1,024- by 768-pixel color graphics. It can also be configured to work with lower bandwidth monitors, such as NEC Corp.'s Multisync, at either 1,024- by 768-pixel interlaced or 800- by 600-pixel noninterlaced resolution.

The Cadcontroller has a serial port for connecting a digitizer or a plotter. GTCO's Micro Digi-Pad digitizer can draw power directly from the board's serial port, the vendor said.

Cadcontroller costs $777; a random-access memory option costs $495.

GTCO, 7125 Riverwood Drive, Columbia, Md. 21046. 301-381-6688.

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DATA STREAM

Walter Ulrich

Who'll man the LAN?



An increasingly hot issue for MIS managers to puzzle over, as local-area networks continue to proliferate, involves whether individual departments should have control over their own LANs or whether there should be some kind of centralized oversight of such installations.

In the past, LAN installations tended to be autonomous: bought, installed and managed by local staffs. LANs are now becoming centralized, or wide-area, LANs, and the overseeing of these installations is gaining ground as corporations seek to integrate LANs into company-wide information networks and MIS seeks to gain better control of user computing resources. This can be useful, as long as it does not force groups of users to conform their LANs to a rigid corporate standard that does not address their individual needs.

Companies, when deciding how to oversee their LANs, should take care to balance the opposing imperatives of consoli-

Continued on page 41

Rolm seen scaling PBX heights

Study predicts IBM's might will help propel subsidiary to top by '92

BY ALAN ALPER
CW STAFF

PARSIPPANY, N.J. — IBM subsidiary Rolm Corp., currently languishing in third place in the private branch exchange (PBX) market, will become the top supplier by 1992 by virtue of IBM's prowess in data processing, data communications and network management, according to a recent report by Probe Research, Inc.

If successful, IBM would also reverse years of heavy losses at its Rolm Systems division and transform the unit into a profitable entity within two years, the report said. IBM has invested in computer-aided design and manufacturing and has shared its low-cost manufacturing processes with Rolm, according to Bart Stuck, coauthor of the report and Probe executive vice-president.

IBM plans to conquer the PBX market by leveraging in-house manufacturing and design smarts, large account control and accumulated sales and marketing acumen, according to the New Jersey-based consulting firm. Spearheading IBM's effort will be the 8750/9750 PBX line, which is the first Rolm switch to be introduced and sold directly by IBM.

"Since more of the purchasing decisions are being made by the MIS executive the telecom manager now reports to, IBM will be dealing with customers it knows quite well," Stuck said.

Among the PBX's strengths, Probe said, are breadth of voice and data applications, Integrated Services Data Network (ISDN) support, future support of IBM's Systems Application Architecture and integration of voice capability into Netview, IBM's network management architecture.

Based on an anticipated 7% annual growth rate in overall PBX line shipments and anticipated higher prices of switches with integrated data communications capabilities, Probe estimated that IBM will grow from $1 billion in PBX revenue this year to $2.5 billion in 1992.

Feedback

While it is still early to assess the products' market acceptance, since they only began shipping a few months ago, initial customer feedback is positive, Stuck said.

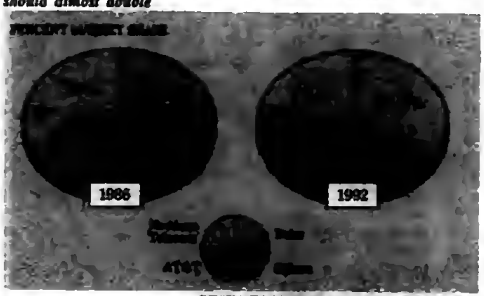
IBM chose to "get this product ramped up quickly and then go back and fix it" and is committed to adding additional capabilities, such as remote diagnostics, that customers are clamoring for, Stuck stressed.

If IBM vaults over AT&T and Northern Telecom, Inc. to become the leading worldwide PBX supplier (see chart at left), the market share gains will come primarily at the expense of second-tier suppliers, Stuck said. All totaled, the Big Three are expected to increase their world-

Continued on page 41

IBM's Rolm to conquer the PBX field

Over the next four years, private branch exchange installed base should almost double



INFORMATION PROVIDED BY PROBE RESEARCH, INC.
CW CHART

Micros can access VAX via OSI net

NEW YORK — Touch Communications, Inc. in Scotts Valley, Calif., chose the recent Dexpo East 88 show to launch the latest of its Open Systems Interconnect (OSI) networking software packages.

Touch Terminal is said to allow an Apple Computer, Inc. Macintosh or an IBM Personal mmal emulation software to establish sessions with a Digital Equipment Corp. VAX/VMS host over an OSI local-area network.

Despite its name, Touch Terminal is not a terminal emulation package but "allows users to take advantage of OSI networking capabilities while retaining the familiar commands of most existing [terminal emulation] applications," Touch President Bill Fello said.

Providing terminal emulation across an OSI network eliminates the need for dedicated serial or modem lines, according to Fello.

Touch Terminal also permits the user to establish several sessions with one or more hosts over the network, as long as the microcomputer's operating system or terminal emulation package supports concurrent sessions, Fello said.

Additional software

Touch Communications also provides a software package that is said to allow VAX/VMS hosts to communicate over an OSI network using existing VAX software.

The OSI standard is a government systems procurement requirement as of 1990.

Touch Terminal is slated to be available in June. Pricing is not yet available.

As a promotional offer, Touch Terminal will be provided as a free addition to any other Touch OSI software product that is ordered through the end of September, according to Touch Communications.

Inside

- MAP/TOP broadband specification is ready and waiting. Page 40.
- Simpact adds Ultrix-supported interfaces for VAXBI-based machines. Page 41.
- Kinetics rolls out Ethernet card for the Mac II. Page 42.

Roger, Lockheed, that's a qualified go for ISDN test

BY KATHY CHIN LEONG
CW STAFF

SUNNYVALE, Calif. — Nearing the end of a so-far successful Integrated Services Digital Network (ISDN) trial, Lockheed Missiles & Space Co. seems optimistic about the technology but is not quite ready to commit itself to the emerging telecommunications standard.

Although Jim Mathieu, Lockheed's supervisor for telecommunications planning, conceded that ISDN seems to meet Lockheed's needs, he stressed the importance of accessing the real costs of ISDN before embracing the technology. Overall, however, Mathieu gave a thumbs-up to his ISDN pilot because it not only did what the vendors told him it would, but it also barely altered the way users conducted their day-to-day computing activities.

Lockheed is the first of three companies that Pacific Bell plans to use for ISDN trials. The others include an undisclosed business in San Francisco and Chevron Corp., located in nearby San Ramon, Calif. In the Lockheed pilot, 20 to 25 users were selected from different departments, including security, general procurement and missile systems.

Mathieu was more than willing to have Lockheed used as a test site when Pacific Bell first approached him. "I was screaming about this three years ago, because I knew this was down the road." ISDN is no longer a theory, he said. "Users who

Continued on page 41

Modem pooling cuts costs

BY PATRICIA KEEFE
CW STAFF

FREMONT, Calif. — Omnitel, Inc. will soon begin shipping a family of what it claims are the first firmware-based modems, which turn a personal computer into a multiuser modem server.

The Netcomm product family reportedly creates a full asynchronous communications server on a network, providing cost-effective modem pooling for a large number of users. Up to four modem cards, each providing four modems in one, can be loaded into a PC server, supporting a total of 16 ports.

At the heart of what is described as a "modem in a processor," digital signal processing is used for typical analog modem functions. The product also takes up less PC resources than outboard modem cards because it is firmware-based.

The internal modem has already been adopted by MCI Communications Corp. for use with its Comm Desk Manager software in two scenarios: in a stand-alone workstation that replaces telex for accessing long-distance lines and for using electronic mail; and as a message server capable of determining message priority and best times to transmit, such as when the rates are lower, Omnitel said.

Netcomm product specifics include the following:

- The Q2400 and Q1200 modem cards. The cards fit IBM's Personal Computer and compatibles, are used for local-area network and multiuser applications

Continued on page 40

MAP broadband specifications ready

BY KATHY CHIN LEONG
CW STAFF

WARREN, Mich. — As promised by the MAP/TOP Media Committee, the Manufacturing Automation Protocol/Technical and Office Protocol broadband specification is finished and available to those interested in setting up factory networks.

According to Ali Bahrololoomi, who is chairman of both the Media Committee and the MAP Task Force, the specification is a strategic document for users, because it details how to allocate broadband channels to accommodate applications other than MAP. It also features broadband maintenance, testing and physical installation rules.

"What instructions users rely on are from the supplier, and that differs from vendor to vendor," Bahrololoomi said. Many MAP users may have broadband networks that handle only MAP, not other potential applications such as voice or video.

Up until now, there has not been any consensus on how to install a broadband cable system for MAP.

In addition, the Institute of Electrical and Electronics Engineers, Inc.'s standards committee has endorsed the broadband technology, but none of the standards groups have addressed the MAP specifications.

"Broadband is more than a cable," Bahrololoomi said. "It is a system that involves many complex issues. You can't simply lay down a cable and expect that it will automatically transmit the right signals from the head-end modulator."

The $24 broadband document represents 2½ years of input from more than 200 users, vendors and broadband equipment designers. Bahrololoomi expects that the strategic document will be the basis for broadband MAP implementation for years to come.

The MAP/TOP Media Committee is also working on a similar carrier-band specification slated for June availability. Activity on a fiber-optic media specification will probably follow, according to Bahrololoomi.

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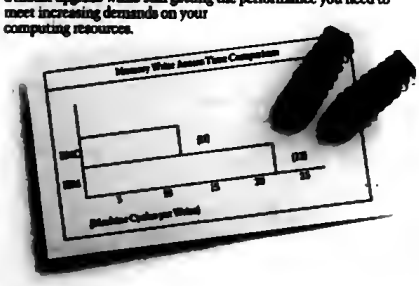
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EMC² The System Enhancement Company.

Modem

FROM PAGE 39

and feature PC AT command set compatibility. The Q2400 has four 2,400/1,200/300 bit/sec. modems on a full card and costs $1,799. The Q1200 has four 1,200/300 bit/sec. modems on a full card and costs $895.

• Asynchronous Communications Server (ACS) software. Priced at $995, ACS provides modem server capabilities for IBM Netbios LANs, autodialing, direct connection to hosts and security features.

• Virtual Communications Adapter (V-Com). Priced at $179, V-Com replaces individual modems in workstations and directs communications traffic to the ACS server. Popular PC communications software, such as Crosstalk Communications' Crosstalk and Data Storm Technologies, Inc.'s Procomm, can be used simultaneously, and serial devices can be shared.

The Netcomm series can support up to 16 users and nodes, providing modem access to all network users at a significantly reduced cost, Omnitel claimed.

To achieve the above configuration, a traditional approach calls for installing 16 phone lines and purchasing 16 internal modems, Omnitel said. Using 2,400 bit/sec. modems and factoring in a cost of $40 per month per phone line, Omnitel estimated the total system cost for one year to be $18,064; for three years, it is $33,424.

The Omnitel Modem Server enables users to share four modems, configured as follows: four phone lines, one IBM PC XT clone, 16 V-Com cards, a network interface card, software and one 4-Modem Netcomm board. Factoring in the same $40 per month per line cost, Omnitel's approach is estimated to cost $10,173 for one year and $14,013 for three years.

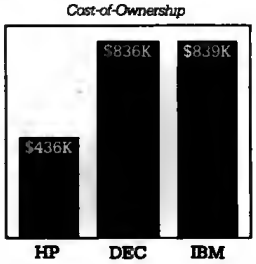
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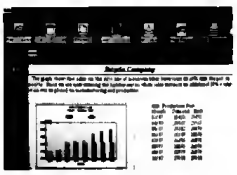
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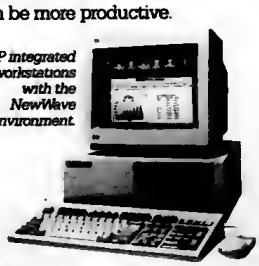
ulate different data forms— text, spreadsheets, graphics, images, even voice—from disparate sources throughout the system.

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HP integrated workstations with the NewWave environment.



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Furthermore, the NewWave environment will run under OS/2, when available, and provide future support for MIT's X-Window System™ and Microsoft's Presentation Manager.

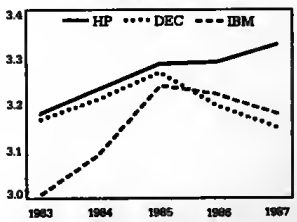
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Ulrich

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dation and customization. Customization is the tailoring of facilities and services to meet the unique requirements of the local user; this philosophy tends to support local oversight. Consolidation merges the requirements of a large population of users to achieve economies and efficiencies — a philosophy that tends to support centralized oversight instead.

The arguments in favor of customization are many. The unique needs of the local situation are best understood by the local team, and local control means local support.

On the other hand, some degree of centralized oversight can make sense. Many successful companies have established exacting standards and demand uniformity across their facilities nationwide. Corporate oversight consolidates technical expertise: Many companies' network support staffs are spread thin enough without having to do needs analysis, installation, implementation and support for one LAN installation at a time.

It don't come easy

The technology is now available to tie different LANs together. However, inefficiencies occur at each intersection between LANs. Additional hardware, software and communications facilities are required. A coherent and consolidated LAN strategy can sharply reduce the number of network intersections, improving performance and ease of use while allowing better sharing of resources.

In this environment, there are fewer distinct network products to manage or be considered. Network control and management activities can be more sharply focused. Also, future network integration problems can be better anticipated or eliminated, and installation and operational costs can be decreased.

For most companies, the arguments in favor of centralized LAN oversight outweigh arguments in favor of localized control. But it is still possible to implement aspects of local LAN oversight within a primarily centralized strategy.

Generally, a balanced plan between centralized and decentralized oversight would work as follows:

Corporate communications and information systems management should have primary responsibility for evaluating LAN alternatives. The best technical staff from the organization should be brought together as a team for this evaluation.

Several LAN alternatives should be approved, since one type of network is rarely ideal for all of a company's applications, user populations and computer installations.

Next, each division and decentralized location could select from a menu of approved LAN standards. This approach — mixed oversight — will ensure that the LANs on the approved list fit the overall corporate approach. However, the local organization should have the final say in selecting a LAN.

Consolidated and coordinated efforts are required to evaluate the complex alternatives and to narrow the range of possibilities. Local control is mandatory to garner local support and ensure unique local requirements are met. Multilevel and multigeographical cooperation is essential. Mixed oversight for LANs makes the most sense.

Ulrich is a Partner with Coopers & Lybrand in Houston and consults with leading companies on a wide variety of communication and computer issues.

Rolm

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wide PBX market share from 70% to 80% during the next four years, the report noted.

Stuck said he envisions little chance for AT&T and Northern Telecom to thwart IBM's momentum. "IBM has designed its new product with integrated voice and data from the ground up," he said. "The other two companies have not and will have to reassess what to do with their products."

AT&T, Stuck pointed out, has the resources to alter its product line and could play its Unix and ISDN cards to its advantage. Northern Telecom, which is smaller, has fewer alternatives, he said.

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BIT BLAST

Simpact develops DEC interfaces

Simpact Associates, Inc. in San Diego has introduced a family of Digital Equipment Corp. Ultrix-supported of communications interfaces for DEC VAXBI-based computers. The protocol interfaces include CCITT X.25, X.25 DDN, IBM's High-Level Data Link Control, Advanced Data Communications Control Procedure, Synchronous Data Link Control, Bisynchronous Communications, Digital Data Communications Message Protocol and Manufacturing Automation Protocol. The interfaces are based on Simpact's multiport, single-slot ICP1632 front-end processor, said to be the first DEC-licensed product for the VAXBI. Using native-mode ICP1632 can result in throughput improvements of up to 6-to-1, Simpact claimed.

Apollo Computer, Inc. has signed a pact with **Ki Research** to supply Apollo with software linking Apollo workstations to Digital Equipment Corp.'s Decnet. The software is said to provide Apollo users with access to files and programs on DEC equipment tied to Decnet using existing Apollo communications utilities. This would allow bidirectional communications between Apollo and DEC systems. The software is also said to allow the workstations to function as DEC terminals and communicate over Decnet Phase IV Ethernet networks. Volume shipment of the Apollo product is slated for the second half of this year, Apollo said.

Attachmate Corp. recently claimed to be the first third-party vendor to support IBM's Enhanced Connectivity Facilities/Server Requester Programming Interface (ECF/SRPI) on its 3270 micro-to-mainframe software. Now a standard feature of Attachmate's Extra Connectivity Software, the interface allows IBM Personal Computer or Personal System/2 users to use ECF Virtual Print, Virtual Disk and Virtual File programs, the vendor said, so users no longer need to purchase IBM's 3270 emulation programs in order to provide ECF connectivity on a PC or a PS/2.

IBM has made **Soft-Switch, Inc.** in Wayne, Pa., a member of its Industry Marketing Assistance Program, thereby agreeing to cooperatively market the vendor's electronic mail connectivity software. Soft-Switch's software gateways provide electronic messaging interconnectivity between IBM, Wang Laboratories, Inc., Digital Equipment Corp., Novell, Inc., 3Com Corp. and other vendors' systems, allowing users to exchange E-mail, editable documents and binary files across the various systems.

Datapoint Corp. in San Antonio has announced its intent to support the the CCITT X.400 Message Handling System, an electronic messaging standard.

Lockheed

FROM PAGE 39

think that ISDN isn't going to come better get up and get moving."

Implementing ISDN has enabled Lockheed to realize some significant cost savings in network configuration and software updates, Mathieu said. Like many other businesses, Lockheed was using separate wiring schemes for voice and data as well as a myriad of hardware and software products that must coexist in the same office environment.

In addition, some 70% of the company's employees move to other locations every year, resulting in the expensive and cumbersome rerouting of cables as well as software changes for workstations and telephone sets, Mathieu said.

Configuration simplified

In contrast, at departments using the ISDN network, voice and data transmissions travel over a common twisted-pair wiring scheme that connects various user areas via an AT&T 5ESS switch at the local Pacific Bell central office. Connections are handled by 55 Basic Rate ISDN lines, each of which supports two 64K bit/sec. digital channels and a separate channel for signaling.

Standardized ISDN connections greatly simplified network reconfiguration at Lockheed and made relocation of user terminals a matter of unplugging the equipment from one wall outlet and moving it to another.

Another reason for the trial's success is that users were able to run their existing workstation and host applications unaltered, Mathieu said. The only noticeable changes to the network were a new type of telephone on the desk and users' ability to transmit data at 19.2K bit/sec. instead of 1,200 bit/sec.

Applications featured in the trial included terminal emulation, video monitoring and other basic file-transfer applications from PC-to-PC and PC-to-host IBM mainframes.

AT&T was the trial's supplier of phone sets and terminating units, which provided the appropriate wire interfaces between the telephone wire and the voice/data phones. An ISDN PC Card from Atlanta-based Hayes Microcomputer Products, Inc. was used for file transfer. Lockheed used off-the-shelf communications PC software in conjunction with Hayes' ISDN PC Card.

Some glitches occurred during the early part of the trial, according to Rod Rucker, a systems specialist with Pacific Bell who has been on the Lockheed premises daily. These included some initial problems with the network termination units, some minor central office switch failures and an instance in which one of the ISDN lines was not operating because of an old bridge tap on the phone line. But many of the problems were resolved through software changes and changes in DIP switch settings, Rucker said, adding that none of these glitches caused users to lose data.

"I expected there to be more failures, but there weren't," Mathieu said, noting the real surprise of the test was that the 30-year-old wiring in the buildings really worked.

With the six-month trial officially ending next month, the next logical step, according to Mathieu, will be for Pacific Bell to perform a cost analysis on the entire project.



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NEW PRODUCTS

Links

Etherport II, an Ethernet interface card for the Apple Computer, Inc. Macintosh II, has been announced by **Kinetics, Inc.**

Etherport II is said to allow users to connect Macintosh IIs directly to an Ethernet network providing communication with Digital Equipment Corp. VAX/VMS systems, computers running the Unix operating system and IBM Personal Computers.

Etherport II costs $795.

Kinetics also reduced the price of its Etherport SE, an internal option card that provides a direct connection to Ethernet for the Macintosh SE, to $795.

Kinetics, 2500 Camino Diablo, Walnut Creek, Calif. 94596. 415-947-0998.

Advanced Computer Communications has enhanced its **ACS 4030** remote Ethernet bridge, which links two separate Ethernet local-area networks.

The upgraded version offers the choice of a point-to-point or CCITT X.25 packet network link between the Ethernet LANs. It also allows the network manager to set network configuration tables from a remote network site.

Features of the ACS 4030 include a choice between adaptive and static routing, protocol independence and compatibility with IEEE 802.3 and thin-wire Ethernets. Modem rates from 1,200 to 64K bit/sec. are supported.

The ACS 4030 is priced at $4,975.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101. 805-963-9431.

A 23- and 15-GHz microwave radio link for extension of the IBM 3274 cluster controller and up to 32 connections to terminal devices when a direct connection is not possible has been announced by **Microwave Networks, Inc.**

The **Micronet 3X74 Extender** acts as a direct replacement of coaxial cables and provides up to 32 Category A device or terminal connections over one microwave link at distances up to three miles. Features include speeds to 2.36M bit/sec.; protocols that are half-duplex, serial and IBM-transparent; compliance with Part 94 of FCC rules; individual channel diagnostics; and fault-status indicators.

Available in eight-, 16-, 24- and 32-port rack-mountable configurations, the Micronet 3X74 Extender costs up to $15,000.

Microwave Networks, 10795 Rockley Road, Houston, Texas 77099. 713-495-7123.

Modems/Multiplexers

Fibermux Corp. has announced the **FX7440W**, a four-channel twinaxial multiplexer that supports IBM System/36 and 38 applications.

According to the vendor, the FX7440W carries the outputs of up to four of the IBM minicomputers over a single pair of optical fibers to as many as 28 daisy-chained peripherals, including IBM 3180 terminals.

A stand-alone version is priced from $2,500 to $4,500, depending on the configuration.

Fibermux, 9428 Eton Ave., Chatsworth, Calif. 91311. 818-709-6000.

Method Systems, Inc. has introduced the **Mini Mux** and the **Mighty Mux** eight-channel multiplexers.

The multiplexers offer transmission distance flexibility via standard internal jumpering, offering one-, two- or three-mile options. The Mini Mux operates at data rates up to 9.6K bit/sec., and the Mighty Mux operates at independent data rates up to 19.2K bit/sec.

The Mini Mux costs $395, and the Mighty Mux costs $495.

Method Systems, 3511 Lost Nation Road, Willoughby, Ohio 44094. 216-942-2100.

Multiplexers designed to connect asynchronous terminals to computers at distances to one mile over a single four-wire circuit have been announced by **Patton Electronics Co.**

Four- and eight-channel versions with RS-232 or RS-422 interfaces support speeds up to 9.6K bit/sec. with simultaneous full-duplex operation of all channels. Full diagnostics include loop-back and line tests.

Prices start at $295.

Patton Electronics, 7958 Cessna Ave., Gaithersburg, Md. 20879. 301-975-1000.

An IEEE 488 bus extender with a built-in 2,400 bit/sec. modem has been announced by **ICS Electronics Corp.**

The **ICS Model 4888** allows interconnection of IEEE 488 bus controllers and their instruments over the direct-dial telephone network. The user's computer can place calls to each remote site as required, and each remote site can call in whenever necessary. The local 4888 can store the telephone numbers for its remote site, and each remotely located 4888 serves as a controller for the remote instruments.

Features include automatic error detection and correction, data compression and software transparency.

The ICS Model 4888 costs $1,895.

ICS Electronics, 2185 Old Oakland Road, San Jose, Calif. 95131. 408-432-9009.



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SYSTEMS & PERIPHERALS

HARD TALK

James Connolly

Is MVS/ESA enough?



They said they wanted differentiation. They finally got differentiation.

Since early 1985, when IBM introduced the 3090 family of mainframes, the system's critics have complained that there was too little to distinguish the machines from the older IBM 3080 family. As a result, many potential 3090 customers found used 3080s to be a more economical purchase than new 3090s.

Now, IBM has come forward with a new operating system — one that not only cannot be used on s 3080 but cannot even run on the original 3090s. IBM's release of MVS/ESA is a clear statement that this will be the basic operating system for the successor to the 3090 — commonly called Summit. It represents a major step toward full utilization of the 3090's key features, particularly with the ability to hold data, rather than just instructions, in expanded storage.

But two questions remain: Is the differentiation too late to help the 3090 white out its brand as a failure, whether that mark was deserved or not? And

Continued on page 48

3480 makers catch up at last

PCMs finally breaking IBM's stranglehold on cartridge market

BY JEAN S. BOZMAN
CW STAFF

For the past three years, IBM has had the entire tape cartridge field to itself, as competitors struggled to fashion devices compatible with its 3480.

From the March 1984 announcement of IBM's replacement for its 3420 tape drive until now, IBM has shipped, by most estimates, 30,000 to 40,000 of the 3480 drives in the U.S. as well as another 10,000 worldwide.

The devices were added to IBM shops that were converting tape libraries to the 220M-byte tape cartridge format. But there were other applications, including using the cartridges for software distribution by mail — and the transfer of data between separate IBM systems.

In the face of shipments totaling 10,000 to 12,000 per year, none of the major plug-compatible manufacturers (PCM) was able to deliver equivalent technology. Now those companies — National Advanced Systems (NAS), Memorex Telex N.V., Storage Technology Corp. and Aspen Peripherals Corp. — appear to have drawn abreast of 3480 technology.

Shipments of the NAS 7480 drive and the Memorex 5480 began last fall, and volume shipments are now under way. Stor-

Continued on page 47

IBM maintenance price boost a trend?

BY STANLEY GIBSON
CW STAFF

User reaction to IBM's recent maintenance price increases has been mild, but industry observers are watching IBM's moves warily to see whether the giant of Armonk continues to boost prices after slashing them throughout 1987.

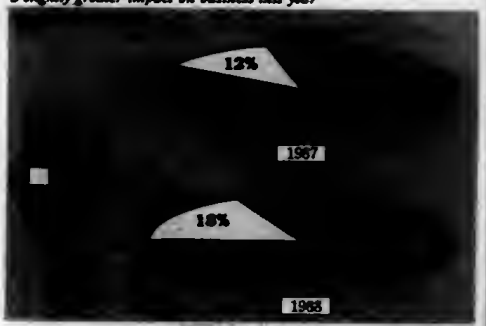
IBM raised Maintenance Agreement charges 7% on its 3080 series of mainframes, effective June 1 [CW, Feb. 15]. The price hike also applies to customers who have the Corporate Service Amendment (CSA) to the Maintenance Agreement, a long-term discount plan for customers who take care of some maintenance themselves. In addition, IBM raised hourly service rates across the board by 15%.

One 3081 user in the Southeast who just signed s CSA agreement said be is satisfied with his savings despite the price hike and has no plans to withdraw from IBM maintenance. He had been under a regular Maintenance Agreement but said be was attracted to CSA when a

Continued on page 48

Eye on CSA

Leasing companies see IBM's Corporate Service Amendment having a slightly greater impact on business this year



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CW CHART

Multiuser Unix line extended

BY J. A. SAVAGE
CW STAFF

SAN JOSE, Calif. — With influence from its new parent company, Taiwan-based Multitech Industrial Corp., Counterpoint Computers, Inc. is bridging its product line of Unix-based multiuser computers to the small computing market with the introduction of the single-processor System 15 for up to 26 users.

Counterpoint is also expanding upward with the multiprocessor System 22, which is intended to host from 17 to 192 users.

Until now, Counterpoint had one product, the System 19, which could be expanded by plugging in up to 10 processors.

Counterpoint merged with Multitech in November 1987. Multitech's primary business is personal computers, noted Counterpoint President Pauline Alker. It markets PCs that can be connected to Counterpoint's systems as networked stations.

On the high end, the System 22 can be configured with up to

Continued on page 47

Inside

- NAS enhances solid-state storage devices. Page 50.
- Burr-Brown announces bar-code terminal for keyless data entry. Page 50.

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7224

Speeds reach 400 cps draft. You can also print graphics, bar codes, and oversize characters without GDDM, BGU, or other special software. Output can be in black or up to eight colors.

Fully integrated (no box!), the ISI 7224 connects directly to IBM 3174/3274/3276 controllers or S/3X twinaxial cable.

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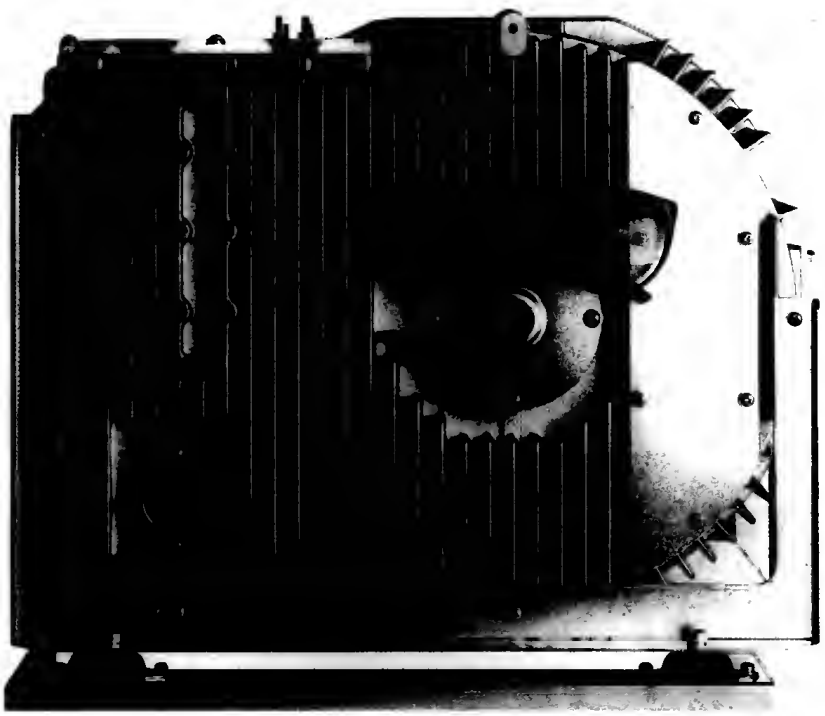
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3480 makers

CONTINUED FROM PAGE 43

age Technology's 4480, announced last year as part of the larger Storage Technology automated library system, has been shipping since December. And Aspen Peripherals has shipped hundreds of its 3480-type drives to the OEM marketplace since April 1987.

In addition, another competitive system based on Hitachi Ltd. drives may soon be available from Comparex, a joint venture in Europe between BASF AG and Siemens AG, according to Louise Biggs, a senior industry analyst at market research firm Dataquest, Inc.

These competitors will take at least a 22% share of the 3480 market, which is expected to grow by 15% or more each year, according to Dataquest. Currently, about 39,000 3480-type drives are installed in the U.S., with about 50,000 worldwide. Dataquest said that by 1991, some 112,000 units will be installed in the U.S., with overseas presence growing at a comparable rate.

Worldwide growth predicted

By 1991, the worldwide OEM marketplace should grow to 30,000 units shipped per year, said Dave Guy, vice-president of field operations at Aspen Peripherals. His company ships 3480 compatibles for attachment to IBM mainframes, Digital Equipment Corp. VAXs and other mid-range systems through the small computer systems interface. End users record data with the devices from non-IBM systems for later use on 3480s attached to IBM hosts.

If the future is so bright, what took these vendors — all of them familiar with IBM plug-compatible manufacturing techniques — so long?

"It was an exotic piece of technology, especially in the area of the thin-film heads," answered Bob Katzeff, vice-president of Disk/Trend, Inc. in Mountain View, Calif., and a consultant on IBM peripherals. Biggs added, "It was all new technology. The 3480 went from nine tracks to 18 parallel tracks, and it introduced a new chromium dioxide media."

Analysts concurred that the PCMs had to reinvent the wheel, fashioning their own very large-scale integration components to duplicate the 3480's functions.

At the same time, they added enhanced functions — partly to offset the fact that the PCM prices were so close to IBM's list price. Traditionally, PCMs have tried to price IBM-compatible CPUs and peripherals at levels 15% to 20% below IBM's list price. In this case, however, most PCM 3480-compatible prices are within 5% of IBM's list price of $65,430 for the IBM 3480 string controller and about $43,120 for each additional IBM 3480 drive.

"The pricing reflects the fact that there was a high research and development cost associated with this product," Biggs said.

NAS and Hitachi, its Japanese supplier, devised a data-compression algorithm that allows users to fit 400M to 600M bytes of data onto a single NAS 7480 cartridge.

Memorex, which is shipping a Fujitsu Ltd. drive, also offers a twofold data compression feature, according to Bob Bodnar, director of storage marketing at Memorex.

The Memorex 5480 also offers a standard buffer of 2M bytes — nearly four times greater than the IBM 3480's original 512K buffer and twice the standard 1M-byte buffer for the 3480. NAS offers a tape-position display and an eight-cartridge automatic loader. The NAS and Memorex models have displays that swivel, allowing operators to monitor tape activity from across the room.

As with other IBM plug-compatible equipment, just as the gap between IBM and its market followers closes, IBM is ready to set the wheels of progress in motion again with a new round of technological advances, according to one industry analyst.

William S. Husband, a senior consultant at the Meridian Leasing Corp., a Deerfield, Ill., leasing firm, said the 3480's specifications could change as soon as this summer. The enhanced 3480 cartridges would have 500M bytes, Husband said, and each string of 3480 drives would be able to handle two concurrent I/O operations. Support for channel speeds of 6M bytes or more is also planned, he added.

Unix line

CONTINUED FROM PAGE 43

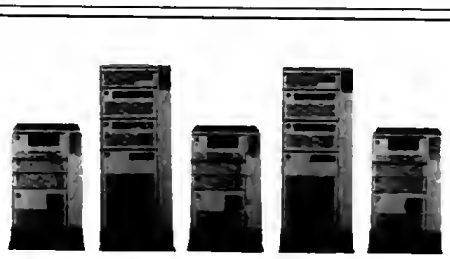
10 Motorola, Inc. 68020, 25-MHz processors. It runs at 4 to 32 million instructions per second (MIPS), according to Counterpoint, and has a standard 4M bytes of memory. It is priced at $19,000.

Another version of the System 22, the 22E, has ECC memory instead of parity memory. Its basic configuration, with 16M bytes of memory and 70 users, starts at $56,000.

The smaller System 15 runs on a single Intel Corp. 80386 processor at 20 MHz. It runs at 3.5 MIPS and has 4M bytes of memory. The System 15 is priced at $5,500.

Alker said Counterpoint will continue to support both types of microprocessors.

The System 22 operates on Counterpoint's C-XIX 3.0, the company's version of Unix. The System 15 carries Microsoft Corp. MS-DOS and Unixmerge capabilities. The System 22 is available this month. The System 15 is expected to be available in April.



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Connolly

FROM PAGE 43

what comes next?

Despite carrying the blame for IBM's financial weakness during the past few years, the 3090 has been fairly successful. Users have aired a minimum number of performance complaints. In analyses of revenue production, the systems have sold relatively well.

There is a real possibility, however, that MVS/ESA shipments in August may prove too late be a major factor in 3090 sales, since observers expect IBM to announce Summit only a year or so later.

The availability of MVS/ESA on a 3090 may be most useful as a development environment allowing leading-edge users to have MVS/ESA applications ready when Summit arrives. It is also likely to help 3090s coexist with Summit processors if IBM introduces a clustering concept with Summit.

What's next?

Regarding what comes next, Vice-President and General Manager of IBM's Enterprise Systems unit Carl J. Conti took time during the MVS/ESA announcement to rule out any more major enhancements for the 3090E series during the first or second quarter of this year. That means the processors that observers have nicknamed the F series will not be introduced until at least midyear, six months or more after most analysts predicted.

Some analysts interpreted other IBM comments and literature as saying that whatever new functions are delivered with the F models can be accessed only through MVS/ESA.

Conti provided a brief look at one of the features of future mainframes the day after the announcement while speaking at a seminar sponsored by Boston market research firm The Yankee Group. He said there have to be major changes in the I/O structure of mainframes not only with support for faster channels but also with better access to on-line storage devices. He noted that the current I/O architecture lets mainframes share disk drive strings only when each string is connected to each mainframe.

Conti said that the "all-to-all" approach has to be changed to an "any-to-any" architecture with dynamic communications between mainframes and disk drives being handled by a powerful switch.

That lends credence to the scenario being sketched by a growing number of IBM watchers, who say that Summit is more than a new processor. It is an environment in which 370-type mainframes can be clustered through high-speed bus connections, fields of disk drives hang off another bus that allows access from any of those mainframes, data bases are managed by special-purpose processors and end-user applications are off-loaded to other processors.

The concept is becoming clearer. But can IBM implement the strategy fast enough and well enough to fight off what are likely to be continued advances by minicomputers, super personal computers and distributed data bases?

Connolly is *Computerworld's* senior editor, systems & peripherals.

IBM

FROM PAGE 43

five-year option and round-the-clock service were added to the discount plan last year.

He said he entertained bids from third-party maintenance firms but in some cases was deterred because of IBM's parts availability policy changes of last year, which make it more difficult for some maintenance providers to stay stocked with parts. "The 7% is part of the agreement. And I would have to pay that anyway under the straight Maintenance Agreement," the user said.

The manager of a West Coast data center running a 3084 said the 7% price hike is of little concern to his firm and will not cause it to move to a newer machine. "But it probably will sway someone who might be thinking of leasing a 3090 or a 3080 from a third party. They might lean toward the 3090," he said.

Others reacted more sharply to the price change. "Now that they've squeezed the competition, they've raised the price," said Tom Martin, president of Computer Financial, Inc., a leasing company in Hackensack, N.J. "IBM has a coordinated, or master, strategy to get maintenance contracts in-house."

Donald Goodspeed, president of Computer Maintenance Consultant, Ltd. in White Plains, N.Y., offered, "The strategy is to encourage the customer to move on to the 3090. People have not been moving off of 3080s, because they work well."

Goodspeed also said he does not think the cost of maintaining 3080s has gone up as much as the price hike would indicate. "Prices are what the market will bear. They have nothing to do with delivery cost," he said.

The consultant said the 7% raise is equal to the CSA upper limit for a piece of equipment under the plan. An increase greater than that amount on a single item would entitle a customer to withdraw from the plan without giving several months notice, as is otherwise required.

"I predicted six months ago this would happen," the 23-year IBM veteran said. "Price reductions have stopped. You will now see a strategy of price increases," he said.

Jim Paster, marketing manager of the IBM business segment of Control Data Corp.'s Engineering Services Division, agreed that the move is calculated to steer customers away from 3080s. "This intertwines maintenance pricing with hardware strategy and makes it clear what they want the customer to do."

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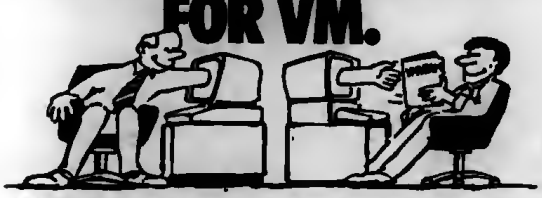
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Communications managers need more hands as they try to manage growing networks with inadequate resources

DISCORD IMPEDES NETWORK CONTROL

BY MICHAEL LEIBOWITZ



P. CHARLES LADOUCEUR

Mike Allen knows how important data is, particularly the data that describes how efficiently his networks are running. Before taking charge of Premier Bancorp, Inc.'s telecommunications operations, Allen presided over a much smaller network but spent far more time in management meetings, listening to complaints.

"They would tell me, 'Your response times are atrocious, really bad,' " he recalls. "Sometimes that was in fact true, and I knew it was true." But more often than not, Allen says, the problems were perception rather than fact. "Yet, I could not refute what they were saying," he adds.

So when Premier Bancorp, located in Baton Rouge, La., began merging its individual computer operations into a statewide network a year and a half ago, Allen fought for, and won, the right to set up and staff facilities to measure vital statistics on the network's performance.

The new performance management system will give frequent reports on the network's operation, allowing Allen to take corrective action long before a user sees a problem. Once a month, he will send those reports to users.

"I just felt it was essential in order for us to do our job correctly," Allen says. "If I'm not performing — if my networks aren't doing what they're supposed to be doing — [this system] is going to tell me about it. And we'll let the world know it."

Measuring, reporting and analyzing network performance numbers — key elements in the discipline called performance management — are gaining popularity as networks spread out beyond simple, back-office hookups to become the business backbone of many corporations.

With networks tying together terminals and computers of far-flung departments across cities and oceans, an increasing number of MIS executives are calculating the extent to which their organizations have staked portions of their businesses on network performance and are investing in tools to help manage that performance.

According to Thomas W. McDonald, a consultant with Management Technology Group in Natick, Mass., as corporations began to use networks as a strategic weapon for competitive advantage, they began saying "the network is not a utility anymore — it's a corporate asset, and its got to be managed like a corporate asset."

Communications managers are quick to agree on that point, noting that when the performance of the network degrades, so can a company's strategic edge and overall efficiency.

If a firm's customer service representative cannot respond quickly to a billing dispute or if a brokerage house wastes time in processing a transaction, the business will lose valued customers.

If response is chronically slow on a bank's automated teller machines or if an airline cannot complete a reservation quickly, customers will go elsewhere. And with more back-office personnel tied into networks, the consequences of lagging efficiency can mean higher overtime and labor costs.

Rose Mary Gabler, a product marketing manager with BGS Systems, Inc., a Waltham, Mass.,

Leibowitz is a free-lance writer based in Brookline, Mass.

Network

FROM PRECEDING PAGE

vendor of performance management tools, says recognizing the need for performance management is a relatively recent phenomenon among communications executives.

Gabler says the 1986 introduction of Netview, IBM's centralized network management system, drove the message home. "It raised the level of consciousness among the network people who have been historically more concerned with availability — keeping the system up and running — as opposed to how it's performing," she says.

Easier said than done

But appreciation of a concept and actual implementation are two different things. A number of problems have acted as a brake on the growth of network performance management.

> "YOU NEED a way of tying the data together through some kind of network control functions. Those products don't exist."
>
> ALAN LEVY
> INTERNATIONAL SYSTEMS SERVICES CO.

First and foremost, there is the sheer complexity of data gathering in networks that typically consist of a far-flung assortment of products from a variety of vendors.

Managing the performance of any system is a multistep process that begins with the measurement of vital statistics such as response time, utilization, uptime and error rate.

On a weekly basis, the performance numbers are collected and compiled into a report. Performance management personnel analyze this data to ensure that pre-established performance objectives are being met. If the response times are encroaching dangerously on objectives, MIS personnel may opt to do some tuning to alleviate bottlenecks.

On a monthly basis, a report showing actual performance and comparing it with objectives is usually sent to management outside MIS and to vendors.

What sounds like a time-consuming task is even more difficult and time-consuming in the case of networks, says Tom Ross, a partner with St. John's Consulting Group in Westfield, N.J.

Instead of measuring performance statistics of one item, such as the mainframe, personnel engaged in network management must gather data on a host of components, such as controllers, modems, communications lines, multiplexers and front-end processors, most of which originate from different sources.

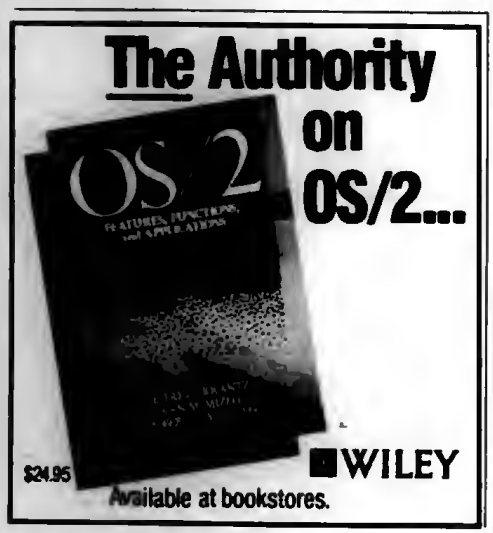
Few of the tools that currently exist for network management are designed to cope with that sort of heterogeneous environment.

Plenty of tools are available for monitoring the separate components of a network, Ross says, but a small number can pull such diverse data together and provide analysis of it in a common report.

The data from one component, such as a modem, is of little use to performance managers alone. It is only valuable when integrated with other pieces of data, thus reflecting the performance of the whole network.

Alan Levy, a senior manager

Continued on next page



Managing complex challenges of work load growth

BY ROSEANNA TORRETTO

Work load growth presents the biggest performance management challenge at the Health and Welfare Agency Data Center (HWDC) of the State of California.

The mission of HWDC, a 200-employee data center located in Sacramento, Calif., is to provide cost-effective data processing capability in the form of computer and communications equipment, software and expertise to the 12 departments of California's Health and Welfare Agency.

Computer processing is provided on three nearly independent systems. An IBM 3033 Model U is used as a facilities management system for one department. Five percent to 10% of an Amdahl Corp. 5890 Model 300 uses MDF to carve out a niche for IBM VM services within the agency.

The primary system, which is shared by every user department, processes production, test and development work loads consisting of IBM CICS transaction processing, TSO and both prime- and off-shift batch jobs.

Since January 1984, the data center's IBM MVS/XA system with JES2 has grown from a single IBM 3084 Model Q processor to one IBM 3090 Model 400 and approximately 90% of the Amdahl 5890.

HWDC performance management is based on service-level objectives, which are determined by customer need. These objectives concern response time, turnaround time and availability.

> THE DATA CENTER'S biggest and most interesting challenge has been to manage one critical CICS application with more than 550,000 transactions per day.

Response-time levels establish, for example, a parameter that says 90% of on-line transactions will be completed within a minimum amount of time — usually less than four seconds — and are gauged according to customer transaction submission. Availability and turnaround goals are set to fall at 95% of possible performance.

The previous day's system and network availability, work load volumes and response time for each CICS application and TSO are reported every weekday morning at a systems problem status meeting attended by HWDC management and staff.

Service-level objectives that have not yet been met are identified as problems and assigned to a member of the performance measurement and capacity planning staff.

This group of five programmer analysts is responsible for performance measurement, work load forecasting, capacity planning and so on. Staff members report on the status of the unmet service-level objectives at the daily meeting.

Although service-level objectives for on-line systems are not explicitly translated into I/O performance objectives, the performance of data storage subsystems is monitored closely.

This is because I/O time is a major contributor to on-line response time. Direct-access storage device (DASD) I/O response time components are reported daily by volume, as is cache control unit performance.

Responsibility for data storage management is split by the HWDC's technology and operations divisions, with the technology group responsible for the lion's share of performance issues. The data management section of the operations division is responsible for the management of DASD space and its availability.

For the shared system, DASD storage includes 200 volumes of single-capacity IBM 3380-type DASDs and 100 volumes of double-capacity DASDs. One-third of the volumes are attached to IBM 3880 storage control units with cache.

Improvement alternatives

Sometimes performance improvement requires more powerful resources to be installed. In 1985, a CICS region shared by several applications experienced unacceptably high response times and failed to meet service-level objectives because of I/O delays for Software AG of North America, Inc.'s Adabas volumes.

At the same time, TSO experienced high response times for transactions that required access to catalogs, RACF, load libraries and other system data sets. Cache analysis tools from hardware vendors were used to show that service-level objectives could be met and consistent response time could be provided to Adabas and TSO users through the use of caching.

System data sets, TSO data sets and on-line production data bases such as Adabas and Cullinet Software, Inc.'s IDMS/R were then cached. The cache analysis tools were used in problem analysis to reevaluate cache size requirements and data set placement and to select additional data sets to be cached.

Another time, HWDC took advantage of efficiencies built into a new software release, which improved application performance by minimizing I/O activity to the RACF data set. An RACF 1.7 option to use extended storage dramatically reduced the number of prime-shift I/Os to the RACF control data set from 3.6 million per day to less than 100,000.

For batch systems, turnaround time for unscheduled batch jobs is reported weekly to make sure the system is meeting service objectives. Goals for scheduled batch jobs, based on input queue wait time, are also reported at this time.

When turnaround time is unacceptable, the data center tries to identify bottlenecks, which are often found in storage media. In 1985, HWDC improved service by providing dramatically

Watching the system grow

Increased demands on California's Health and Welfare Agency data center have required the agency to more closely monitor all aspects of system performance

	1984	January 1988
Number of CICS transactions per week	2 million	6 million
[illegible]	[illegible]	[illegible]
Number of batch jobs per week	20,000	30,000
[illegible]	[illegible]	[illegible]
Number of gigabytes of direct-access storage	100	250

CW CHART

Torretto is a senior programmer analyst at the Health and Welfare Agency Data Center of the State of California in Sacramento.

fewer tape errors and faster throughput by migrating to cartridge media.

The schedule simulation facility of Computer Associates International, Inc.'s Data Center Management System is used to simulate peak work loads. This helps to estimate the number of tape drives needed to meet production job schedules. A tape library of 80,000 cartridges and 32 IBM 3480 magnetic tape subsystem drives currently serves the system.

Innovative Data Processing's Fast Dump Restore, which takes weekly full-volume backups, was selected for its speed, since it requires only 20 minutes to back up a double-capacity volume.

That company's Automatic Backup and Restore, chosen for its versatility, is used to take daily incremental backups, securing only changed data sets. Sterling Software, Inc.'s DMS/OS is used to migrate and move data sets and to create customized reports. Computer Associates' FastDASD is used to evaluate data set placement based on activity and seek delays.

The challenge of size

HWDC's biggest and most interesting challenge has been to manage one critical CICS application with more than 550,000 transactions per day. This application will grow to one million per day by the fourth quarter of this year.

The application's response time has improved significantly through the years as HWDC acquired faster processors and faster data storage subsystems. Improved data transfer times and DASD seek times have reduced DASD I/O response time from 35 msec to 5 to 10 msec.

The future performance characteristics of this application are uncertain; attempts to model it have been disappointing. Analytic modeling tools break down when CICS, which runs in a single address space using more than 50% of a single processor, is modeled running on a multiprocessor. Attempts are currently under way to modify the application.

As current on-line applications grow and new applications are added, HWDC needs to process increasing amounts of data and I/O activity rates. Faster access to data is a must, but simplified data storage management is also required. For the data center, device addition, migration and allocation need to be simplified. Data set performance requirements need to be managed by the system.

Through the years, HWDC has been able to take advantage of hardware and system software developments to improve performance specifications. What is needed now are the staff and systems resources to explore the expanded storage opportunities now being offered. •

Network

FROM PRECEDING PAGE

with Boston-based consulting firm International Systems Services Co., explains that performance management is especially difficult when dealing with distributed networks having heterogeneous nodes and when trying to manage data flowing from one network to the next across different topologies.

Nonexistent tools

Again, the problem is a lack of integration. "You need some way of tying the data together through some kind of network control functions," Levy says. "Those products don't exist."

"The data we get is rich. We probably get all the data we need," says Jim Cox, manager of technical resources at Texas Utilities Services Co. in Dallas, about the tools that monitor performance on the company's 5,000-device IBM Systems Network Architecture (SNA) network that serves its customer service agents.

But the big problem has been tying all this data together. In some cases, Cox's people have had to write their own analysis programs, which can be a time-consuming task. In other cases, "you have to make your own analysis of the different layers separately," he says. "It takes manpower."

Just about everyone points to the lack of trained manpower as an impediment to performance management of networks. Although tools provide summary data automatically, getting to the root of a response time problem when one arises is more difficult.

"It is one thing to produce numbers and information; it's something else to know what to do with them," says Mario Morino, president of Vienna, Va.-based network analysis tool vendor Morino Associates, Inc.

"The guy doing network performance work is facing multiple disciplines — he may be facing an IBM SNA network, tied to a X.25, tied to a Decnet," he adds, referring to Digital Equipment Corp.'s network.

Bring in specialists

Because the issues involved are so complex, network management is really a job for network specialists as opposed to performance management generalists, according to Management Technology's McDonald.

Unfortunately, however, good network people are hard to find, and the ones s communications department does employ are usually kept too busy with maintenance issues to worry much about analysis and optimization.

Performance management ends up taking a backseat. The state of networks today still involves so much fire fighting that performance management has to take s back seat, according to BGS Systems' Gabler.

Performance management could prevent many network fires through detection of potential bottlenecks, according to McDonald, but the problem is in breaking the problem-response cycle.

"If we took the time to do performance management properly, we would be less in reactive mode," he says. "But we're in reactive mode, so we can't take the time to manage the network properly. So we stay in reactive mode."

Catapulting into a proactive stance requires solid management backing because of the investments of staff and money required by performance management of networks.

Take advantage of change

Sometimes, the opportunity for presenting s case for the commitment arises when major changes are made in the organization of the company's corporate network.

Texas Utilities Services, for example, first began doing performance management of its network after the organization merged the operations of three individual Texas-based power companies.

And at Premier Bancorp, Allen obtained the resources to do performance management after the organization merged the bank operations of its eight member banks.

Reorientation toward performance management can, however, also be accomplished through bottom-line reasoning.

At Eli Lilly & Co., s pharmaceutical firm in Indianapolis, end-user complaints about long response times were sufficient enough to convince communications personnel that they needed a performance management system.

The asset approach

Rather than just present the case for such a commitment to management in the form of negatives, however, the company's telecommunications group armed itself with financial models that compared the cost of doing performance management with the manpower savings from increased end-user productivity, calculating return on investment figures for the performance management system.

"We used an approach [where we said] you have to treat end-user productivity as a corporate asset," explains Dan Franz, a senior systems analyst in the group. "Then you can start building s lot of financial models out of that."

The costs that were sold to management included the cost of dedicating approximately 120 man-hours per month, along with equipment maintenance fees and purchase and setup charges.

The company installed an Avante-Garde Computing, Inc. Net/Alert Plus performance monitoring system that captures data on its 180 IBM 3270-type communications lines spanning s worldwide network.

The monitoring system as installed at Eli Lilly consists of s stand-alone minicomputer connected to 3270-type lines coming into its Indianapolis headquarters, as well as remote monitors at two other data centers in San Diego and Bathingstoke, UK.

The system collects data on such things as line utilization, response times and transaction volume and has been used extensively to reconfigure lines, line speeds and satellite configurations, according to Franz.

Network personnel are now able to head off complaints by using the performance management system to perform tuning before end users ever see a problem, Franz says.

But what may have been even more important in reducing negative feedback is the system's ability to document good service.

Reports on response time performance are now sent out on a monthly basis to managers of end-user departments as well as the vice-president of MIS. Those reports have had s marked impact on user satisfaction, Franz says.

"We have really cut down the number of complaints based upon distributing the information to the user," he says. "People remember just the bad times. But now, they can see that



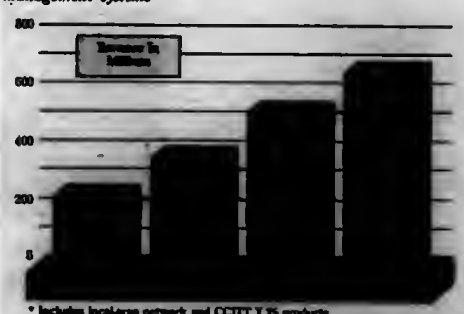
What users want from next-generation network management systems

- Reduction in technician manpower required for network operation
- Reduction or elimination of network downtime by automatic self-healing or bypassing initiated by the network management system
- Each network element monitored by the system
- Reduction or elimination of network management system duplication
- Better and more straightforward interface with human operators
- Better compilation, analysis and presentation of statistical and general performance data
- Monitoring extended to systems software, communications software, applications software operation, hardware and at least Level 4 of the seven-level International Standards Organization model

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> "IT IS ONE thing to produce numbers and information; it's something else to know what to do with them."
>
> MARIO MORINO
> MORINO ASSOCIATES, INC.

although response time may have degraded during a peak time, that is not the norm."

Management is also happy with the system. In fact, Robert Groves, Eli Lilly's telecommunications manager, says the company would allocate the resources to do more performance management if it were feasible. Unfortunately, he says, the tools are weak even if the spirit is willing. The next major challenge is to push performance management outward from the 3270 network to Eli Lilly's worldwide Decnet, which supports a vast population of ASCII devices. For now, however, Groves says this task can only be approached in piecemeal fashion.

Eli Lilly has purchased several performance management tools, but Groves says they need to be integrated into an overall performance management system. "We need tools," he says. "We need integrated tools. We're trying to take a view on Ethernet as a corporate distribution facility — host to host. So we're looking at those tools, and we've got some of them. But we're trying to figure out how to organize them in a way that you can do overall network management."

Groves says the big issue in doing such an integration is not so much the labor involved but in doing it "in such a way that it can grow as additional capabilities come on board."

"I think the challenge," he says, "is what are you going to do when the distributed processing eats you alive? It's not that you don't want to manage the network — it's that you can't."

Texas Utilities Services has also had to settle for partial management of its data communications network.



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- Data communications
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Upcoming issues of Spotlight will explore these subjects.

We invite readers to submit vendor-specific questions in these areas so we can obtain the answers for you and for others with similar concerns.

Please address all submissions to Deborah Fickling, Associate Editor, *Computerworld*, 375 Cochituate Road, Framingham, Mass. 01701-9171.

UNTIL RECENTLY, local networks have not had major performance demands placed on them, making the task of LAN management relatively simple.

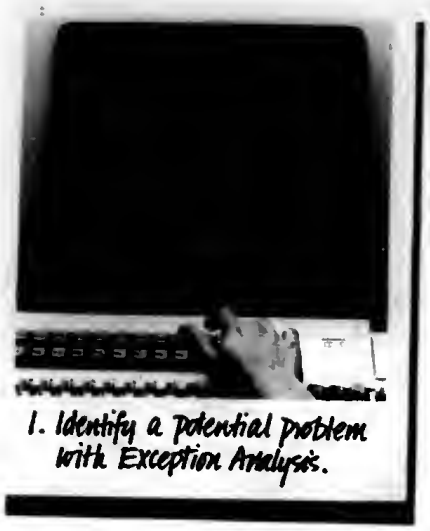
Although this electric utility's DP subsidiary installed a performance management system on an IBM CICS-based SNA network that serves its customer service agents, it runs two other networks without monitoring them. The SNA network, consisting of 12 front-end processors located throughout Texas, is connected by primary and backup routes to three IBM 3090s and one IBM 4381 mainframe at the hubs.

In managing this network, the company makes use of several tools — IBM's Netview and its Service Level Reporter data base and BGS Systems' Best/1-SNA network modeling package and Capture/SNA network snapshot facility.

Cluster controllers with hardware response-time monitors have been installed in all the critical areas — particularly customer-service centers. "We

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know exactly what they're getting," says Texas Utilities Services's Cox.

Each month, MIS sends reports graphing the past month's response times to the power utility's customer service groups. MIS has a goal of providing two-second or less response times 90% of the time, a goal the company has consistently met through its performance management efforts. While no service-level agreement exists, the response time objective is published in the company's corporate objectives.

According to H. B. Keating, Texas Utilities Services' director of information services, his organization would like to manage performance of the company's 1,000-device Hewlett-Packard Co. network and its 300-device Intergraph Corp. network, but the tools to do so do not exist. "In those areas, we go more by the noise level. . . . 'Are we getting complaints or not?' " he says.

LAN lag

For Dana Gargano, director of corporate support services at Primerica Corp. in Greenwich, Conn., the noise level is beginning to exceed tolerance limits in the company's local-area network sector.

Network management products for LANs have been particularly slow to emerge. According to Mark Leary, program manager for the Communications Technologies Service at Framingham, Mass.-based International Data Corp., this lag can be attributed to the somewhat embryonic nature of LANs.

Until recently, local networks have not had major performance demands placed on them, making the task of LAN management relatively simple and of little interest to either vendors or users.

Mounting complaints

But Gargano is currently faced with mounting user complaints about the peak-period performance of the company's 200-workstation Novell, Inc. LAN and management requests for performance information similar to that provided for Primerica's IBM 3083-based system.

Currently, Gargano's group is evaluating Network General Corp.'s Sniffer LAN Protocol Analyzer, which provides information such as number and type of packets flowing across the network.

> "I THINK as LANs evolve more, there will be other vendors out there that will fill this particular void."
>
> DANA GARGANO
> PRIMERICA CORP.

Sniffer, costing approximately $20,000, is expensive and does not provide such information as server utilization, average response time and number of cache hits, Gargano says.

As for other products, there are packages to monitor direct-access storage device utilization on the system's 20 Compaq Computer Corp. 386 servers, "but they're primitive at best," he says.

Gargano says he is waiting for Novell to introduce a performance management tool that would help fill in the gaps and anticipates additional products will become available from other vendors.

"I think as LANs evolve more, there will be other vendors out there that will fill this particular void," he says.

Too many cooks

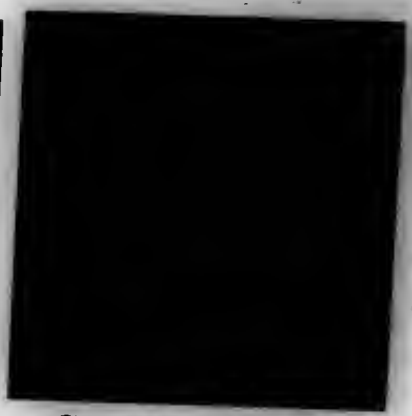
While there are undeniable deficiencies and gaps in the tool supply at all levels, there are also organizational barriers to effective performance management of networks.

In some companies, Gabler says, network personnel do not have any access to performance data for the company's host system.

Although most companies have folded their communications department into the MIS structure, performance management in many shops is still done independently by each department.

And, according to Morino of

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interface lets you press a key and look directly into your CICS system so you can immediately answer questions about transaction response time, exceptional conditions, and resource utilization.

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Morino Associates, the boundaries are often too rigid to permit effective sharing of performance data. "This guy's responsible for the network, this guy's responsible for the data base and this guy's responsible for operating systems. You have to get three departments to work together to troubleshoot a problem. That's very difficult when you don't have a point of integration," he says.

A better organizational tack, Morino suggests, would be to create a higher level group that could look at performance across the board. "There is no line between the host and network anymore," Morino says, "but I don't think we've yet come to grips with that fact."

Dust gathering

Lack of follow-through with use of purchased tools is also a common failing, according to Management Technology's McDonald. Many companies install performance management tools to deal with a specific problem and then neglect to use those tools or update them on a regular basis.

"They use these tools to find out where the bottleneck is and to make sure they get good service," McDonald says. "And then the thing is put on the shelf. Or, they buy it and set it up for a system and get some regular reports. And in six months, those reports are meaningless, because the system has changed and no one has put in the time to adjust it."

And, according to BGS Systems' Gabler, after purchasing performance management tools, 98% of major network customers end up doing performance management on a "catch-as-catch-can" basis.

> "THERE IS no line between the host and network anymore, but I don't think we've yet come to grips with that fact."
>
> MARIO MORINO
> MORINO ASSOCIATES, INC.

The payoff

Companies that are doing performance management regularly are finding that it pays off. Northwestern National Life Insurance Co., headquartered in Minneapolis, is a medium-size shop that has been doing network performance management for about three years, according to Tom Fischer, manager of network systems.

Northwestern National's commitment to performance management involves dedicating half of one MIS staff person's time on an ongoing basis to monitoring, analyzing and tuning its network, which consists of two IBM 3090s connected to 3,000 terminals and then sharing the data with 20 IBM System/36s in the field. In addition, the company spent about a year during the last few years developing an internal package for integrating its tools, including BGS Systems' Best/1-SNA and Capture/SNA, IBM's Netview and Network Performance Monitor and Morino Associates' MVS Integrated Control System.

While having to expend that much effort to create an integrated system was far from ideal, Fischer says, the results have been worthwhile. Since installing the system, MIS has consistently met its commitment — spelled out in service-level agreements signed with users — of providing 3½-sec. response time to users 90% of the time.

Fischer also points out that the performance management data is also used in capacity planning, which is where the cost savings can be particularly obvious.

By using the tools, for example, Fischer's group was able to prove that the addition of extra system facilities recommended by a vendor would be unnecessary. That single finding saved the company $750,000 a year.

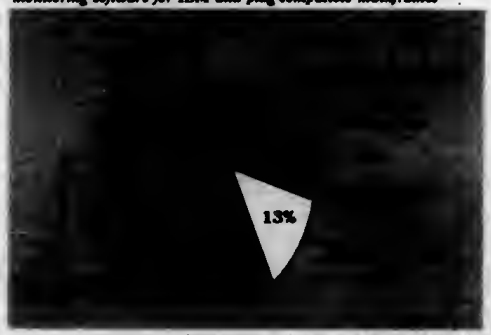
Northwestern National's programmer Robert Choban adds that performance management has become particularly important since the company began to off-load applications from the 3090s to the System/36s last year.

"Off-loading means you can keep your host under control, but your network becomes more important. If there's going to be a bottleneck, that's where its going to be," he says.

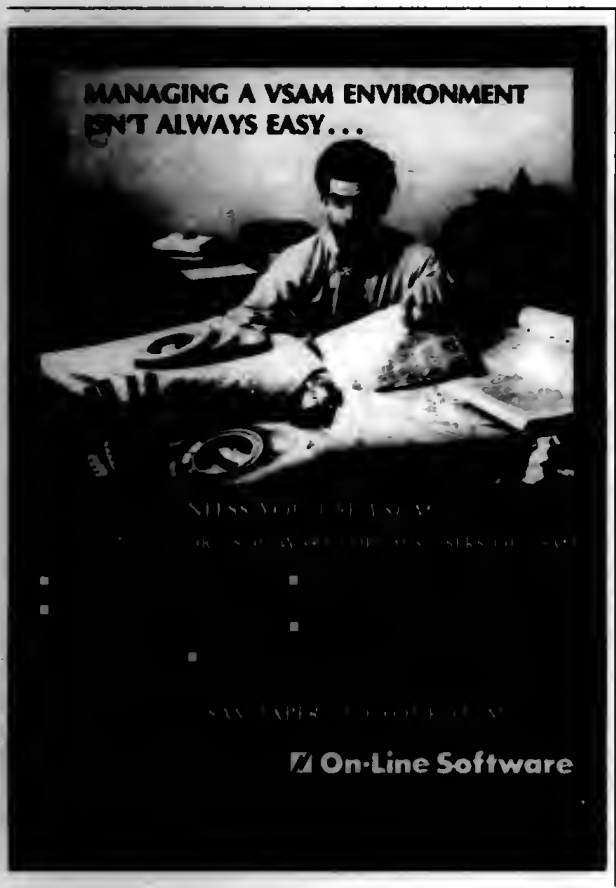
"These tools can easily justify themselves if you just do the business analysis and see what it buys you," Fischer says. "The payoff is in allowing the network to run at peak efficiency "without having to go out and acquire more facility than you need." ●

Measuring up

Market share, January 1988, for performance measurement and monitoring software for IBM and plug-compatible mainframes



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Network management systems

COMPANY	PRODUCT	HARDWARE, SOFTWARE OR COMBINATION	STAND-ALONE OR INTEGRATED	HARDWARE PLATFORM	NETWORK ENVIRONMENTS MANAGED	ON-LINE NETWORK STATUS MONITORING	REMOTE FACILITY TESTING	LINK-LEVEL DIAGNOSTICS	THROUGHPUT ANALYSIS	CONFIGURATION MANAGEMENT	SECURITY AND ACCESS CONTROL	JOB ACCOUNTING AND CHARGEBACK	MODELING AND SIMULATION	ON-LINE GRAPHICS REPORTING	AD HOC REPORT GENERATION	HISTORICAL DATA BASE REPORTING	PRICE
Alda Computer Communication (714) 979-7000	Mini	Hardware	Stand-alone	NA	Proprietary	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	$6,000
	Attack Resource Manager	Combination	Integrated	NR	Proprietary	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	$6,300
Allen Systems Group, Inc. (813) 649-1300	Shopmon	Software	Stand-alone	All IBM and compatibles, except systems running DOS	IDMS	Yes	No	No	Yes	Yes	Yes	No	No	Some	No	No	18,250-$24,500
Amnet, Inc. (847) 870-8300	Nucleus 7000	Combination	Stand-alone	Micro	WAN* X.25	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	$19,900
Applied Computing Devices, Inc. (812) 232-6051	Network Knowledge Systems	Combination	Integrated	Mini	SNA; T1; X.25; synch; asynch; voice/data, fiber networks	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	NP
Applied Digital Data Systems, Inc. (subsidiary of NCR Corp.) (516) 231-6400	Micom/Link	Software	Either	Mainframe systems	Point-to-point systems, with X.25 option	Yes	Yes	No	Yes	Yes	Yes	No	No	No	Yes	No	$950
Atlantic Research Corp. (703) 644-9000	NTS 4000 Distributed Network Restoration, Test and Management System	Combination	Integrated	Micro	WAN	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	NP
AT&T (201) 898-8800	Access T1.5	Off-the-serving office	NA	NA	T1	No	No	No	No	No	No	No	No	No	No	No	$400 per port per month
	Dataphone II Level IV System Controller 300/400	Combination	Either	Mini	T1, private-line analog, switch-net and high-speed modems, DSU/CSU*, T1 and port multiplexers, DDS*, LADS*	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	$70,000-$130,000
	Dataphone II Acculink Network Manager	Combination	Either	Mini	T1, modems, multiplexers	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	$60,000-$110,000
	Dataphone Digital Service with Customer Test Service	Software	Integrated	Micro	DDS	No	Yes	Yes	No	No	Yes	No	No	No	No	No	$6.30 per month per circuit
	Software-Defined Network Service with Service Management System and Info Reports	NP	Integrated	Mini	SDTNP	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	NP
	Controlled System Management	Combination	Integrated	Micro, mini	PBX	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	NP
	Visual Maintenance & Administration Panel	Combination	Stand-alone	Micro	PBX	Yes	Yes	Yes	No	Yes	NP	No	No	Yes	No	No	$4,000 (software only)
	Automatic Trouble Tracker	Combination	Integrated	Micro	PBX	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	$60,000
	Automatic Circuit Assurance	Combination	Stand-alone	Micro	Starlan, T1	Yes	Yes	Yes	Yes	Yes	Yes	NP	No	Yes	NP	NP	$7,000-$15,000 per year
	Starkeeper	Combination	Either	Mini	AT&T ISDN or Datakit VCS	Yes	Yes	Yes	NP	Yes	NP	Yes	Yes	Yes	Yes	Yes	Prices $25,000
Avant-Garde Computing, Inc. (609) 778-7000	Net/Command	Combination	Stand-alone	Mini, micro	IBM, SNA*, Decnet, Unisys, X.25, HDLC*, LAN, WAN, T1	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	NP
	Net/Guard	Combination	Stand-alone	Mini, micro	Asynch dial-up	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	NP
	Net/Alert Plus	Combination	Stand-alone	Mini, micro	IBM, SNA, Decnet, WAN, HDLC, Unisys, BSC*	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	NP
Avanti Communications Corp. (401) 849-4000	Open Network Management System	Combination	Integrated	Super micro	T1 backbone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$60,000-$90,000
BGS Systems, Inc. (617) 891-0000	Bestnet Boundary	Software	Either	MVS systems	SNA	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No	$49,050
	Bestnet MSNF	Software	Either	MVS systems	SNA	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No	$67,575
Cabletron Systems, Inc. (603) 332-9400	Multi Media Access Center	Combination	Integrated	Micro	Ethernet	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	No	$2,500-$16,000
	LAN Specialist	Combination	Stand-alone	Micro	Ethernet	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	$5,795

*Wide-area network *Data service unit/channel service unit *AT&T's Dataphone Digital Service *Local-area data set *Synchronous digital transmission network *IBM Systems Network Architecture *High-level data link control *Binary Synchronous Communications *Computer-aided scientific/engineering *Time-division multiplexers *Transmission Control Protocol/Internet Protocol *Synchronous data link control *Packet assembly/disassembly *Fiber distributed data interface *Synchronous time-division multiplexer *Advanced Program-to-Program Communications

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's product, this is designated NA (not applicable). Further product information is available from the vendors.

COMPANY	PRODUCT	HARDWARE, SOFTWARE OR COMBINATION	STAND-ALONE OR INTEGRATED	HARDWARE PLATFORM	NETWORK ENVIRONMENTS MANAGED	ON-LINE NETWORK STATUS MONITORING	REMOTE FACILITY TESTING	LINK-LEVEL DIAGNOSTICS	THROUGHPUT ANALYSIS	CONFIGURATION MANAGEMENT	SECURITY AND ACCESS CONTROL	JOB ACCOUNTING AND CHARGEBACK	MODELING AND SIMULATION	ON-LINE GRAPHICS REPORTING	AD HOC REPORT GENERATION	HISTORICAL DATA BASE REPORTING	PRICE
Case Communications, Inc. (301) 280-7710	9000 series	Combination	Integrated	Mini	CASE modems, multiplexers	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$16,000-$70,000
Cincom Systems, Inc. (800) 543-3010	Net/Master	Software	Integrated	Mainframe	SNA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	$55,000
Codex Corp. (617) 364-2000	Codex 9300	Combination	Integrated	Micro	Modems, stat multiplexers, digital TDM[10], communications networks	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	From $10,000
	Codex 9000	Combination	Integrated	32-bit workstation	Communications networks	Yes	NP	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$60,000
Communications Machinery Corp. (800) 262-8023	DRN-1700/Lanscan	Combination	Stand-alone	Independent	Ethernet, TCP/IP[11], ISO	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	$8,500
Computer Associates International, Inc. (800) 645-3003	CA-Vtam	Software	Stand-alone	Mainframe	SNA, SNA/VTAM	Yes	No	No	No	Yes	Yes	No	No	No	No	Yes	$7,500-$15,100
	CA-Mimbayan	Software	Stand-alone	Mainframe	SNA, VTAM protocols	Yes	No	No	Yes	No	Yes	No	No	Yes	Yes	Yes	$26,000-$49,500
	CA-Netman	Software	Stand-alone	Mainframe	All	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$14,500-$54,000
Computer Software Management & Information Center (COSMIC) (404) 542-3265	NQS-ARC11750	Software	Stand-alone	Mainframe, mini	Any network of Unix-based machines	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	$6,000
Connection Telecommunications (817) 594-8966	Distributed Network Design System	Software	Stand-alone	Micro	X.25, distributed	No	No	No	No	Yes	No	No	Yes	Yes	No	No	$15,000
	Capacity/Q	Software	Stand-alone	Micro	NP	No	No	No	No	Yes	No	No	Yes	No	No	No	$15,000
	Multipoint Network Design System	Software	Stand-alone	Micro	T1, SNA, multipoint, point-to-point	No	No	No	No	Yes	No	No	Yes	Yes	No	No	$17,000
Contel (301) 230-6400	Manager Plus	Software only, combination	Either	Mini	PBX, voice/data networks	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	NP
Contel Resources Corp. (301) 208-3700	IDES	Combination	Stand-alone	Micro	Last mile, local loop	Yes	Yes	No	Yes	Yes	Yes	No	No	No	Yes	Yes	From $12,000
Datacomm Management Sciences, Inc. (203) 838-7183	MTRX-8000, 4000, 1000	Combination	Stand-alone	Micro	WAN	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	$300-$400 per port
	NSM-64	Combination	Either	Micro	SNA	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	$5,000-$75,000
	Anmacs	Combination	Stand-alone	Micro	WAN	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	Yes	$700 per circuit
Datapoint, Inc. (301) 868-6464	Auto-Net Network Control System	Combination	Stand-alone	Micro	Four-wire voice frequency, all protocols	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	$1,400 per circuit
Data Switch Corp. (203) 926-1801	Intellinet Network Performance Management System	Combination	Either	Micro	SNA, BSC, SDLC[12], IPARS, X.25, RJE, Unicope, VIP	Yes	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	From $45,000
Dunnel, Inc. (800) 434-6481	DCP 3000	Combination	Stand-alone	Micro	DDS	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	From $6,000
Dupleg, Inc. (215) 628-4530	MDTS	Combination	Stand-alone	Micro	WAN	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	Yes	$700-$900 per line
	NDTS	Combination	Stand-alone	Micro	WAN	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Some	Yes	Yes	$700-$900 per line
	NAMS	Combination	Stand-alone	Mini, micro	WAN	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	$800-$1,200 per line
Digital Communications Associates, Inc. (404) 442-4000	System 3000	Combination	Integrated	Micro	T1	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	NP
	NMS Version 2.0 and User Services Facility	Combination	Stand-alone	Micro	PADS[13], Series 300	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$10,000-$40,000
Digital Equipment Corp. (Contact local DEC sales office)	Network Management Products & Services	Combination	Integrated	Micro, mini, mainframe	X.25, SNA, DDS, Decnet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NP
DSW Commercial Systems, Inc. (813) 971-6834	Telepak	Software	Either	Micro	PBX	Yes	No	NA	NA	Yes	Yes	Yes	No	Yes	Yes	Yes	$6,000-$95,000
	Telebus	Hardware	Stand-alone	Micro	PBX	Yes	No	NA	NA	Yes	Yes	Yes	No	Yes	Yes	Yes	$3,000-$6,000
Develcon Networks, Inc. (714) 770-1221	Engarde	Combination	Stand-alone	Workstation	WAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	$80,000-$120,000
Dynamics Systems, Inc. (800) 323-3000	Netspy	Software	Stand-alone	Mainframe; MVS, MVS/XA only	VTAM	Yes	No	No	Yes	No	Yes	No	No	Yes	Yes	Yes	$10,000-$30,000
Encom Corp. (214) 423-7183	Network Control System Series/70	Combination	Either	Micro	Standard communications protocols, including IBM, SDLC, IPARS, Unisys	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	NP
Excelan, Inc. (408) 434-2300	Lanalyzer 5100	Combination	Either	Micro	Ethernet, Decnet, Appletalk	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	$4,900
Fiberwave Corp. (818) 709-6000	Lightwatch	Combination	Stand-alone	Micro	Magnum fiber-optic backbone	Yes	Yes	Yes	No	Yes, some	No	No	No	No	Yes	Yes	From $1,000
Fibronics International, Inc. (617) 778-0700	Fibronics Network Management System	Combination	Stand-alone	Micro	FDDI-based[14], proprietary cabling system	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	NP

COMPANY	PRODUCT	HARDWARE, SOFTWARE OR COMBINATION	STAND-ALONE OR INTEGRATED	HARDWARE PLATFORM	NETWORK ENVIRONMENTS MANAGED	ON-LINE NETWORK STATUS MONITORING	REMOTE FACILITY TESTING	LINK-LEVEL DIAGNOSTICS	THROUGHPUT ANALYSIS	CONFIGURATION MANAGEMENT	SECURITY AND ACCESS CONTROL	JOB ACCOUNTING AND CHARGEBACK	MODELING AND SIMULATION	ON-LINE GRAPHICS REPORTING	AD HOC REPORT GENERATION	HISTORICAL DATA BASE REPORTING	PRICE
Gambit Data, Inc. (800) GAM-BALF	Snapstrol	Combination	Integrated	Micro	Ethernet	Yes	No	Yes	Yes	No	No	No	No	No	Yes	Yes	NP
Gejac, Inc. (301) 725-2500	Arnap	Software	Stand-alone	Mini, mainframe	Decnet, VMS Cluster, VMS	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$5,000-$18,000
General Datacomm, Inc. (203) 574-1118	Netcom NMC 70	Combination	Stand-alone	Micro	Analog and digital data sets, multiplexers, STD0[illegible]	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$10,700-$68,700
Halley Systems, Inc. (408) 434-3535	Connect LAN/View	Combination	Integrated	Micro	Broadband backbone networks	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	NP
Hohmann Laboratories, Inc. (201) 840-1217	Rmct	Combination	Integrated	Mini	T1	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes	NP
Hewlett-Packard Co. Information Networks Division (Contact local HP sales office)	HP Network Services	Combination	Stand-alone	Mini	802.3, SNA, Ethernet	No	Yes	Yes	Yes	No	No	No	No	No	Yes	No	NP
	Application Software Products	Software	Stand-alone	Mini	802.3, Ethernet, X.25, point-to-point	No	Yes	No	No	No	Yes	No	No	Yes	Yes	Yes	NP
	WAN Protocol Analyzer/LAN Protocol Analyzer	Combination	Stand-alone	Independent	802.3, X.25, T1, SNA/SDLC, BSC, Ethernet, analog voice networks	Yes	No	Yes	Yes	No	No	No	Yes	Yes	Yes	No	$12,250-$20,100
	HP Network Support Services	Off-site service	NA	NA	X.25, 802.3, Ethernet, SNA, PBX, T1	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	NP
Honeywell Bull, Inc. (617) 896-8900	DSA-Network Control Facility	Combination	Integrated	Mini	Proprietary minicomms, mini, micros in DSA environment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	NP	$1,870-$8,600 software only
IBM (800) IBM-2468	Netview	Hardware	Stand-alone	Mainframe	SNA, can interface to APPC[illegible]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	$7,860-$60,240
Infinet, Inc. (617) 681-0600	NIS Series 900 Manager I	Combination	Integrated	Mini	T1, modems, DDS, X.25	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	From $30,995
	NIS Series 900 Manager II	Combination	Integrated	Mini	T1, modems, DDS, X.25	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	From $40,995
	NIS Series 90 Integrator	Combination	Integrated	Mini	T1, modems, DDS, X.25	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	From $80,995
Infotron Systems Corp. (800) 345-4636	ANM/INX	Combination	Stand-alone	Micro	Stand-alone matrix, data management PBX system	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$10,000
	ANM 1500	Combination	Stand-alone	Micro	T1	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$7,500
	ANM/NX	Combination	Stand-alone	Micro	T1	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$15,000
	ANM 800	Combination	Stand-alone	Micro	56K backbone, access networks	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$10,000
	INM1000 with foreign vendor interface	Combination	Stand-alone	Supermicro	T1, 2M-bit stat multiplexer-based, WANs	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$59,500-$77,550
	INM400 with foreign vendor interface	Combination	Stand-alone	Supermicro	T1, 2M-bit stat multiplexer-based, WANs	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$42,000-$56,050
	INM200 with foreign vendor interface	Combination	Stand-alone	Supermicro	T1, 2M-bit stat multiplexer-based, WANs	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$29,500-$40,050
Interactive Software, Inc. (800) GET-SMART	Smart LAN Performance Test	Software	Integrated	Micro	Netbios, DOS 2.1 and compatible LANs	No	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	$49.95
Integrated Telecom Corp. (214) 234-3340	Integrated Digital Management System	Combination	Integrated	Mini	T1	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	$15,000
Intecom Systems, Inc. (214) 466-8000	Telephone Facility Management System	Combination	Integrated	Mini	Voice	No	No	No	No	Yes	No	Yes	Yes	No	No	Yes	From $150,000
Kentron Industries, Inc. (800) 824-4510 (503) 643-1681 (in Ore.)	Y-Smart CSU	Combination	Either	4,800V interface	T1	Yes	Yes	Yes	No	Yes	No	No	No	Yes	Yes	Yes	$2,000-$2,800
Kinetics Associates, Inc. (708) 734-0404	MICS/Net	Software	Stand-alone	Mainframe, MVS only	SNA	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	$16,500-$30,000
NCR Canton (Contact local NCR sales office)	CAF1 R1 Communication Alerting Facility	Combination	Integrated	Communications processor and display terminal	SNA, BSC, OIS, X.[illegible]5	Yes	No	No	No	No	No	No	No	Yes	No	No	From $185 per month
	Overview R1	Combination	Stand-alone	Micro	SNA, PRE-SNA	Yes	No	No	No	No	No	No	No	Yes	No	Yes	From $200 per month
Netline Communications Corp. (415) 573-1200	NIT	Combination	Integrated	Micro, mini	T1, PBX, modems	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NP
Network Equipment Technologies, Inc. (415) 366-4400	IDNX	Combination	Stand-alone	Proprietary	T1	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes	From $25,000
	INCS	Combination	Integrated	Sun workstation	T1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	$87,500-$130,000
	Enhanced Operators Console	Software	Integrated	Micro	T1	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	$5,000
	INCS Alert Monitor	Software	Integrated	Micro	T1	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes	$2,000
Network General Corp. (415) 968-1800	Sniffer	Combination	Stand-alone	Micro	Ethernet, token-ring, Arcnet, Starlan	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	$30,000-$30,800
Paradyne Corp. (800) 482-3333	Analyzm System	Combination	Stand-alone	Mini	Declink, T1, SNA BSC	Yes	Yes	Yes	No	Yes	NP	No	Yes	No	Yes	Yes	$1,800

COMPANY	PRODUCT	HARDWARE, SOFTWARE OR COMBINATION	STAND-ALONE OR INTEGRATED	HARDWARE PLATFORM	NETWORK ENVIRONMENTS MANAGED	ON-LINE NETWORK STATUS MONITORING	REMOTE FACILITY TESTING	LINK-LEVEL DIAGNOSTICS	THROUGHPUT ANALYSIS	CONFIGURATION MANAGEMENT	SECURITY AND ACCESS CONTROL	JOB ACCOUNTING AND CHARGEBACK	MODELING AND SIMULATION	ON-LINE GRAPHICS REPORTING	AD HOC REPORT GENERATION	HISTORICAL DATA BASE REPORTING	PRICE
Paragon Systems (714) 895-3819	PHASE III	Software	Stand-alone	Mainframe	MVS/VTAM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	From $80,000
Quantronics, Inc. (801) 363-8923	Analycon	Combination	Stand-alone	Micro	SNA BSC, Unisys, IPARS	Yes	Yes	No	Yes	Yes	No	No	No	Yes	Yes	Yes	From $7,785
Racal-Milgo (800) 237-4440	CMS 2000 Communications Management System	Combination	Either	Mini	T1, SNA, BISYNC, dial multiplexers, analog	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	From $8,600
Racal-Vadic, Inc. (408) 432-8008	MDS II YA 9000 System Controller	Combination	Integrated	Micro	Asynch, synch dial-up modems	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	$3,500
Shomiti, Inc. (800) 247-6001 (U.S.) (800) 387-7888 (Canada)	SNMPConfig	Software	Stand-alone	Micro	SNA, IBM non-SNA	Yes	No	No	No	Yes	No	No	Yes	Yes	Yes	Yes	$4,995-$9,995
Southwestern Bell Telephone Co. (314) 235-9374	Product Administration and Data Analysis System	Combination	Integrated	Multiuser micro, mini	Packet network	Yes	Yes	No	Yes	Yes	Yes	No	No	No	Yes	Yes	$30,000
Spectrum, Inc. (408) 370-0303	Integrated Packet Exchange	Combination	Either	Micro	T1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	$25,000-$100,000
Symplex Communications Corp. (313) 995-1555	Maestro	Combination	Stand-alone	Micro	Proprietary	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	$8,900
Tandem Computers, Inc. (408) 725-6000	Distributed Systems Management	Software	Integrated	Minicomputer	Tandem Expand Network	Yes	Yes	No	Yes	No	Yes	No	No	No	Yes	Yes	NP
Technitronics, Inc. (800) 367-3860	Explicit	Software	Integrated	Mainframe	SNA	No	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes	$55,000-$75,000
Telco Research Corp., a wholly owned subsidiary of Symm Corp. (818) 339-6150	Network Pathfinder	Software	Either	Mini, minicomputer	Voice, data, SNA, minicomputer, private packet, multiplexers, T1	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	$195,000-$900,000
Telematics International, Inc. (818) 880-4900	Smartview	Software	Stand-alone	Micro	Smartnet-X.25 Network	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	$3,000
Telenet Communications Corp. 800-TELE-NET	TPS/II	Combination	Integrated	Micro, mini	Packet-switched	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	NP
Teleprocessing Products, Inc. (805) 523-8147	Multidrop Network Management	Combination	Integrated	Micro	DDS, digital networks	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NP	Yes	Yes	Yes	From $12,000
Telesis, Inc. (212) 509-8080	Telesmk	Combination	Stand-alone	Mini	T1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NP
Telwatch, Inc. (800) 422-1266	Netenec 2000	Software	Integrated	Mini	Multivendor physical layer	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	From $25,000
	Netwatch	Combination	Stand-alone	Micro	T1, analog, digital	Yes	Yes, some	No	Yes, voice only	No	Yes	No	No	No	No	Yes	From $3,000
Timeplex, Inc. (201) 391-1111	Link Network Management System	Combination	Stand-alone	Micro	T1	Yes	Yes	Yes	Yes	Yes	Yes	No	NP	Yes	Yes	Yes	NP
	Link/View Network Management Interface	Software	Integrated	Micro	T1, SNA interface	Yes	No	No	No	No	No	No	No	No	No	Yes	NP
	Time/View Unified Network Management System	Combination	Integrated	Workstation	T1, OSI Netview interface	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NP
3Com Corp. (800) NET-3COM	Network Control Server	Combination	Stand-alone	Workstation	TCP/IP, Xerox Network System protocols running on Ethernet	NP	NP	Yes	Yes	Yes	Yes	NP	NP	Yes	Yes	NP	NP
TRW, Inc. Information Networks Division (213) 373-0161	NM2000	Combination	Integrated	Mini	TCP/IP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	$19,000
Tymnet, McDonnell Douglas Network Systems Co. (800) 872-7654	Tymnet	Combination	Integrated	Micro, mini, mainframe	All	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	NP
U.S. West Network Systems (800) NET-CENTER	Net Center GraphE Network Monitor	Software	Integrated	Micro, minicomputer	SNA	Yes	Yes	No	No	No	Yes, some	No	No	Yes	No	Yes	NP
Veralink Corp. (408) 945-1199	Verinet 2	Software	Stand-alone	Micro	T1	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	NP
Vitalink Communications Corp. (415) 794-1100	Vitalink Management Services	Software	Integrated	Supermicro	WAN, 802	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	NP
Wang Laboratories, Inc. (617) 459-5000	Distributed Management Facility	Software	Integrated	Mini	SNA, Wang systems and networks	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	$300-$5,000
Westinghouse Electric Corp. (800) 340-9828	Network Control Interface	Software	Either	Mainframe, IBM and compatibles	VTAM	Yes	No	Yes	Yes	No	Yes	No	No	No	No	No	$6,750-$11,500
Xyplex, Inc. (800) 338-5316	Advanced Network Management Software	Combination	Integrated	Mini	Proprietary	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	$1,500-$3,000
Zenith Electronics (312) 699-2199	Z-LAN 500	Combination	Stand-alone	Micro	Proprietary	Yes	Yes	No	No	Yes	Yes	No	No	No	Yes	Yes	$8,000-$13,000

Disciplines unite to fill resource needs

BY THOMAS BELL

As the organizational need for data processing grows, application requirements often overrun the capacity of existing equipment.

Large IBM IMS and CICS applications now consume the entire capacity of even the largest IBM 3090, and many mid-range systems, such as IBM 9370s and the Digital Equipment Corp. 8000 series, currently support only a single interactive application.

With this kind of resource stress developing, software performance engineers can no longer assume that capacity planners will be able to provide whatever equipment is needed: The need may turn out to be larger than even the most powerful machine available.

Similarly, capacity planners can no longer assume that demands from a variety of applications will smooth out demand peaks.

In recognition of this reality, a merger is being forged between software performance engineers and capacity planners.

The resulting discipline, called system performance engineering, integrates the conventional issues that surround capacity planning — such as load growth, actual processing capacity and hardware loading — with software engineering considerations, such as performance requirement determination, performance prediction and system design improvement.

An unlikely pair

This blending presents an unexpected challenge because it requires technical knowledge from both areas to be applied and historical organizational conflicts to be recognized.

Long-standing and dramatic differences, both in viewpoint and organizational desires, exist between application designers and equipment planners. The former want immediate changes in the technical environment so they can implement applications more quickly; the latter urge caution so that resource requirements can be assessed.

When these differences are overcome, the payoff from combining the two approaches can be substantial, as the following examples demonstrate.

At a major financial institution, a system performance engineering analysis staved off the possibility of a major performance shortfall just prior to an equipment installation.

In this case, a pair of mid-range processors was slated to assume the growing load of a major transaction-based application from an old system. Initial capacity projections, based on an earlier system's requirements, showed that the two machines could handle the new system far into the future.

Measurements taken just before installation, however, indicated that the system would, from the beginning, consume more capacity than the two machines could offer.

Subsequent examination from both the capacity planning and software performance engineers' points of view showed that relatively minor changes — primarily in software — could produce a system with adequate performance. When the system went live, these projections proved to be correct.

Overly optimistic

In another organization, early tests performed on two applications scheduled to run on networks of superminicomputers showed that, in this company as well, capacity projections were wildly optimistic.

New systems were being developed to replace existing applications that were partially automated.

However, in one instance, capacity projections were based on an unrealistic understanding of the actual application design; in another example, developers assumed far greater processing power than was available as well as lower load growth than what actually occurred.

Reexamination of the first application led to some hardware alterations and extensive software changes. Costs were considerably higher than expected, but the required performance was attained.

System performance engineering was undertaken later than the ideal time, but it avoided a system failure.

Reconciling the second application with capacity availability involved both software changes and reallocation of work load between processors. Throughput, although still less than desired, is adequate.

If either of these two companies had brought together software performance engineering and capacity planning earlier in the process, their systems could have been modified at an earlier stage in the development cycle and could have more closely met functional requirements.

Regular-mode, as opposed to crisis-mode application of such a joint effort, is becoming more commonplace, but unfortunately, the impetus for this frequently comes from outside of either discipline.

At one nationwide company, for example, a major new accounting application was scheduled to run under a popular data base management system on several divisional mainframes, based on a capacity plan that considered only throughput and cost.

The only reason this project did not fail was that top management was concerned about whether adequate response time could be maintained with the new application design.

Top management ordered a study that considered the trade-offs of throughput, response time, application design and load growth. The study showed that management's concerns were justified: Even batch processing could not meet the timeliness requirements on the departmental machines.

Going the distance

As this incident demonstrates, technicians can no longer pass off the idea of cross-disciplinary planning. Top managers are recognizing the need for thorough analysis and are beginning to question decisions that appear to be based on incomplete information.

System performance engineering is not necessary for every situation. In most cases, the conventional separation of approaches is far more manageable, yielding results more quickly and at lower cost.

With system performance engineering, analysts must cope with a geometric increase in ambiguity. In this kind of study, nearly all options are open for consideration, and the richness and diversity of alternatives can easily lead to an overload of required analysis.

So when is it really necessary to undertake a more extensive study?

In general, a system performance engineering analysis should be done for any system that is projected to do the following:

- Consume 30% or more of the capacity of hardware controlled by a single copy of the operating system.
- Consume 30% or more of a single processor when the application runs as a single task.
- Use more than 30% of the expected capacity of a data base system.

Such an analysis is also appropriate when large applications necessitate investment in a new mainframe or when any major new system is considered for addition to a mid-range host computer.

Out on the floor

Performance issues are no less critical in departmental computing than for corporate mainframe systems. In fact, departmental systems, and mid-range systems in general, probably represent the most important area for applying system performance engineering during the next few years.

When a system is to be distributed to a variety of these computers, performance problems are magnified by the number of such machines.

System performance engineering is a way to avoid the nearly impossible task of fixing the problems at each location individually.

The analyst, or system performance engineer, projects resource consumption based on existing systems, controlled benchmarks, initial prototypes and experimental data from internal as well as external sources.

The projection should be based on total resources required during heavy-load situations and should factor in all processing demands, including communications software, operating system overhead, data base accesses and so on.

It should also include an engineering reserve that can adequately reflect the uncertainty in loading characteristics, software implementation inefficiencies and any additional requirements that may arise when the system goes into operation.

When that projection is complete, the system performance engineer compares the processing requirement with hardware availability, both for the present time and for the next three to five years.

Typically, the result of the analysis to this point is disconcerting to users and DP managers as well. The processing requirement — in terms of CPU time, disk I/Os, data base access or communication line capability — is far greater than originally anticipated.

Frequently, users' and DP managers' first reaction to the bad news is to ask about the probable response time under the projected load. Response-time projections for lower priority work can be calculated very easily.

Elementary queuing theory shows that the length of the line, along with response time, becomes infinite when the arrival rate (load) exceeds the service rate (processing capacity). First, we must ensure that "rho" (arrival rate divided by processing rate) is less than one, meaning throughput is adequate. Then we examine probable response time.

Bringing down rho

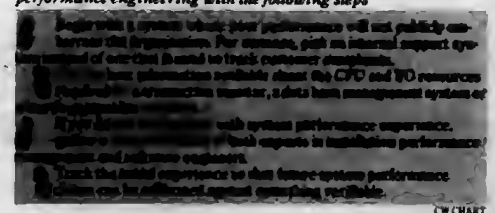
A number of techniques can be used to bring rho down. The system performance engineer must choose a combination of techniques that will bring it to less than one and keep costs under control. Some of the strategies include the following:

- Decrease the load by redefining the business processes, reversing commitments on less important resource-intensive parts of the system or finding another way to use the system that will shift load to the most efficient parts (for example, batch instead of on-line).
- Increase the processing capability by augmenting hardware or reducing other applications running on the same hardware. In general, large hardware augmentation is unpopular because it creates explicit performance problems. Marginal changes are usually acceptable, so careful analysis is needed to ensure that the recommended change is the correct one.
- Reduce the resource requirement by revising the application's use of system support services, including data base

Continued on page S14

Starting out

If you are proceeding with a corporate thrust toward some really large systems or departmental computing, prepare for system performance engineering with the following steps



CW CHART

REGULAR-MODE, as opposed to crisis-mode application of a joint effort, is becoming more commonplace. Unfortunately, the impetus for this frequently comes from outside of either discipline.

Bell is president of Rivendel Consultants, Inc. in Palos Verdes Estates, Calif.

Performance analysis, logically

A different kind of hardware monitor has become important to performance analysts as they pursue an enlarged role in their installations.

For standard computer performance evaluation studies on mainframes, hardware monitors have given way to powerful and flexible software monitors, which can provide the same data and more in either raw or formatted report form.

The analyst can still use a hardware monitor to determine CPU usage, I/O rates and transaction counts on an IBM mainframe, but connecting the hardware monitor to appropriate probe points borders on the impossible.

THE performance analyst needs a broader view to see why a system is underperforming even though each component meets specifications.

For most mainframe performance analysis, a software monitor, provided as an integrated part of the operating system, is a better choice.

The options got better

The responsibilities of performance analysts have, however, expanded outside the mainframe environment and into areas such as communications systems, new types of peripherals, powerful microcomputers and advanced superminicomputers — areas in which software monitors are frequently inadequate or nonexistent.

In these new territories, analysts are finding that a new type of measurement hardware — something called a logic analyzer — is what is really needed to monitor critical interactions.

Originally developed for hardware designers, these tools have proven critical in solving performance problems in environments with advanced hardware.

The performance analyst is frequently confronted with the need to find out why new equipment performs absurdly — why, for instance, a new tape drive on a powerful workstation transfers data at an average rate of only 15% of its advertised speed.

The analyst needs to find out whether the slowdown is attributed to a greater-than-anticipated data load, lengthy handshaking, repeated drive repositioning or something else entirely.

Similarly, if a 9.6K bit/sec. communications line seems to take five seconds instead of two to transfer a full screen of data, the performance analyst must be able to pinpoint where the delay is occurring and whether it is caused by retransmissions, pretransmission waits, processing blockages, operation of the equipment at half the rated speed or something else.

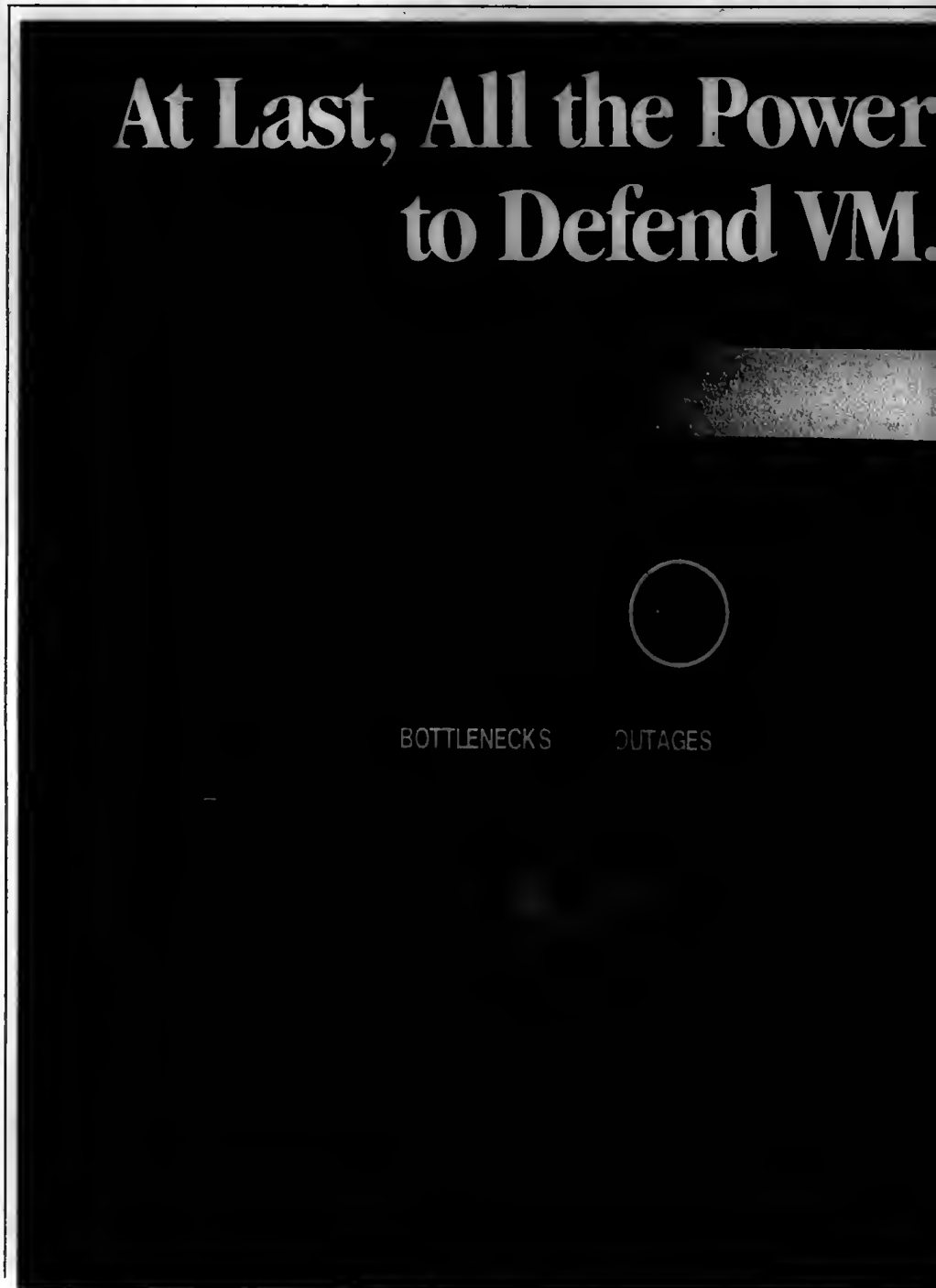
The specialized devices vendors use may be useful, but these typically measure only interactions appropriate for debugging a single piece of equipment.

The performance analyst needs a broader view to determine why an entire system may be underperforming even though each component meets specifications.

Open a new window

In real-life instances of the two problems mentioned above, logic analyzers were able to pinpoint the trouble areas, precisely because they permitted the simultaneous examination of multiple interfaces.

In the first case, the logic analyzer showed that a processor correctly issued a BACKSPACE command to its tape controller, that the controller converted the command into a READ REVERSE and, furthermore, that the tape drive flushed its cache



and repositioned the tape, delaying the processing by about 250 msec for each operation.

A specialized hardware device examining only one interface would not have revealed why a simple BACKSPACE took so long, particularly when the tape drive performed backspace commands rapidly.

In the case of the communications line, the logic analyzer traced the problem to a bug in the communication concentrator. Although a communication line monitor was attached, it only showed that transmission halted and then subsequently restarted after a request for retransmission.

On the other hand, the logic analyzer, because it permitted examination of both input and output from the concentrator, showed that a bit was occasionally dropped from a message that was correctly received.

The major advantage a logic analyzer has over a conventional hardware monitor is its ability to record and report detailed interactions. Conventional hardware monitors do not possess the high-speed memory components necessary to record the raw details. Logic analyzers, can, however, obtain the level of detail required and display it immediately for on-screen analysis.

Like a conventional hardware monitor, a logic analyzer has probes that attach to circuitry so signals can be monitored with minimal interference to the monitored equipment. The old hardware monitors simply set timers and counters to summarize activity on the system.

New logic analyzers, in contrast, have extensive high-speed memory so they can record the sequence of signal changes. This provides the details of interactions so the performance analyst can determine why things got delayed instead of just finding out the extent of the delay.

One thousand to one

A modern logic analyzer can record several thousand changes for each of its probes. Up to 100 probes are typically available. For most practical applications, analysts say 20 to 32 probe lines are adequate, but a larger number may occasionally be required to examine 32-bit address or data lines at several different places.

The depth or number of states that can be stored by a logic analyzer usually ranges from 2,000 to 10,000. Even this number may be inadequate if the states of the probes are recorded frequently — each 10 nsec, for example — but most logic analyzers have an option to store states only when the analyzer is clocked with a signal indicating valid data.

THE MAJOR advantage of a logic analyzer is its ability to record and report detailed interactions.

This may be critically important to the performance analyst when he needs to record situations that occur infrequently over an extended period.

Data trap

Even when states are recorded at fixed intervals, the performance analyst can set up the logic analyzer to capture important information. The states of the signal lines are fed into the memory of the logic analyzer, and each new set of states shifts the previously recorded sets down one place in memory. The analyst sets the analyzer to stop when some critical condition occurs. In this way, the sequence of states leading up to the critical situation can be captured.

The data stored by a logic analyzer can be displayed on a CRT or printed out in several formats. The two most helpful formats, which are actually best used in conjunction, are time line displays and hex character displays. Time line displays permit analysis of the relationships among signal lines over time. Interpreting the signal lines as individual bits in hex characters, on the other hand, facilitates examination of data or address lines.

The cost of a logic analyzer appropriate for computer performance evaluation may be as

Continued on next page

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Unite

FROM PAGE S11

services. A wide variety of opportunities exists to reduce resource consumption in modern systems.

Changing the various techniques for journaling, temporary data storage, coordination between machines and memory management can frequently help to greatly decrease resource use.

- Reduce the resources consumed by the application software itself. Particularly when the application code replicates system services, significant savings can be obtained by modifying application code.
- Modify the options in the support software to reduce the overhead from autonomous services like paging, backups and communication monitoring.

Unsophisticated analyses assume that no such overhead will occur; opportunities in this area are usually exploitable only after initial system integration is complete.

- Reallocate work load to a different processor. When powerful workstations or personal computers are included in the system, they can frequently be assigned more work.

Since the power of these machines is growing rapidly, they may offer many opportunities to correct problems.

More conventionally, functions can frequently be split off in order for them to be processed on another machine or onto another processor in a multiprocessing computer.

Of course, identifying alternatives that may achieve the desired performance is only part of the job. An absolutely convincing case must also be created to explain both the situation and the potential solution. Any change will upset someone's plans, and some may cause acute budgetary problems.

Human issues

Furthermore, it might be necessary to defuse the emotionally loaded issue of whether an alteration to planned computer hardware and software configurations or application designs implies criticism.

Even if he has been associated with the organization prior to the start of the development project, the system performance engineer will likely be viewed as an annoyance by some developers.

These developers will almost certainly be under schedule pressure and will resent what they see as an unwarranted intrusion.

The system performance engineer must parachute onto the scene equipped for rescue but prepared to do battle. •

WITH system performance engineering, analysts must cope with a geometric increase in ambiguity.



Logically

FROM PRECEDING PAGE

low as $5,000 or as high as $50,000, depending on the number and speed of probes, the depth of the memory, the output devices and the maximum rate that data can be stored. Usually, a unit priced between $10,000 and $15,000 is appropriate for performance analysis studies.

Capabilities in addition to the basic ones are available in many analyzers, usually for an incremental cost. These may include a means to put counts in buckets, usually to show address ranges of code being executed on microcomputers. They might also include additional and higher speed probes, improved user interfaces and portability.

Time synchronization across all probes is desirable for high-speed work — even across the pods used to concentrate the signals before running them into the analyzer. If the analyzer distinguishes between probes that collect state information and timing information, both are desirable. Portability is very desirable but not a necessity.

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Operations Control Systems, Inc.
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Smartstart
A catalog job manager for VRX and VRX/E operating systems. Allows one job to start others from anywhere within the initiating job. Allows date card and monitor flag data to be passed from job to job.
Price: $1,500 (perpetual license fee)

Software Extraordinaire, Inc.
(206) 282-9422
Batchman
Job scheduling package for Wang Laboratories, Inc. VS operating system. Schedules and runs background jobs. automatically schedules for single or multiple runs, allows for unattended operation, schedules for specific dates.
Price: $17,000

Unison Software, Inc.
(415) 968-7511
Maestro
A batch job scheduler for Hewlett-Packard Co.'s HP 3000 and Spectrum series. Automates production, job stream preparation, user job request integration, job status documentation and operator activities.
Price: $3,000-$15,900

Unitech Software, Inc.
(703) 264-3301
Uqueue
A print spooler and batch job scheduler for the Unix environment. Includes inactive, or hold, and multiple queues and on-line status displays for all queues.
Price: $300-$2,250

VM Software, Inc.
(703) 264-8000
VMschedule
Job scheduling for IBM VM systems. Tasks can run on a defined schedule. Maintains a data base of activities for system planning and work load projection.
Price: $9,000-$13,000 (one-time license fee) •

ASK THE VENDOR

The following questions were solicited from users and conveyed to the vendors for responses.



Will Anmacs, Datacomm Management Sciences' automated network mangement and control system, eventually include T1 access capability?

George Thompson
Information System Specialist
Southern New England Telephone, Inc.
New Haven, Conn.

DATACOMM MANAGEMENT SCIENCES, INC.: T1 access for test, monitor and limited reconfiguration has recently been accomplished using Anmacs four-wire access system. Anmacs' overlay architecture is currently in use on T1 circuits.

When will OCS have versions of Scheduler, Tape, Chargeback and Private available for Hewlett-Packard Co.'s Spectrum systems?

Kevin Kokaisel
Manager of Technical Services
Cenex/Land O' Lakes AG Services
St. Paul, Minn.

OPERATIONS CONTROL SYSTEMS: Scheduler, Tape and Chargeback have been operational on the Spectrum for some time now and are in use at several customer sites. Private is currently being tested and should be available for release in the near future. Customers planning to upgrade to Spectrum should contact Operations Control Systems for more information.

Does Altai Software's Zeke support multiple systems?

Anna Zinkhon
Scripps Howard Information Systems
Cincinnati

ALTAI SOFTWARE: Yes. Zeke works with the IBM MVS, VSE and VM operating systems. Because a single Zeke catalog is shared across all three, jobs and other events may be scheduled across multiple CPUs running various operating systems. Any event on System A can trigger another event on System B and vice versa.

Does Vital Signs support all current releases of IBM VM/SP and HPO?

Ned Hedrick
Manager, Technical Services
Valmont Industries
-Valley, Neb.

BLUE LINE SOFTWARE: The earlier releases of Vital Signs, which was introduced last summer, supported VM/SP, VM/IS and VM/HPO, although some commonly used VM/HPO performance factors were not reported. Vital Signs currently offers full support for HPO and enhanced direct-access storage device management features, including real-time seek analysis and modeling of double- and triple-density IBM 3380-type devices.

What kind of impact does Rabbit-2 Capacity Planner and Resource Analyzer have on the existing system? How much of the system's current resources does the product require? How easily can Rabbit-2 interface with existing accounting and monitoring files on an IBM VMS system?

Jeff Wood
Systems Manager
New York Casualty
Watertown, N.Y.

RAXCO RABBIT SOFTWARE: Rabbit-2 has virtually no impact on existing resources, as it builds an array in memory and extracts data from the array at memory speeds with no overhead. The product uses the VMS accounting file with process or image data as its primary input. The monitor can also be a Rabbit-2 input with no modification required. •

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VENDOR VIEWPOINT
Network demand strains service delivery

BY JEFF MARINSTEIN

As the explosive growth of computer networks continues, a "good news/bad news" story unfolds.

The good news is that network growth is delivering more computing power and application availability to end users. The bad news is that this growth will lead to performance and service problems that may land MIS in the middle of a real quandary.

The dilemma is how to consistently deliver automated, state-of-the-art solutions to business problems without adversely affecting response time. What users once knew as the computer network has become a highly complex, critical service organization.

The dynamic nature of the present-day corporation, which requires timely access to information to maintain its own competitive edge, has produced an enormous upswing in the number of remotely connected end users. These end users, reared for the most part in the personal computer environment, are more self-sufficient and demanding in terms of response time than any of their predecessors.

As the pattern of network use changes, more corporations are coming to view users as paying customers of MIS. Some companies have already created formal service-level agreements between MIS and end users, wherein a stated measurement has been developed to ensure that the MIS organization is providing adequate service.

While service demands increase, other factors combine to make delivery of consistent service through network performance management more difficult.

The evolving network is becoming more heterogeneous, and combining multiple hardware and software vendors on it requires significant new knowledge on the part of the performance analyst as well as programmers.

In addition, applications have grown more complex. With distributed data base management systems on the horizon, along with applications that may approach the range of 1,000 transaction/sec., networks are now being stressed as never before.

While IBM's Systems Application Architecture may offer much hope for transportable and hardware-independent applications, the additional layer of software will, no doubt, challenge the performance analyst.

Many network performance tools are available from a variety of vendors, but these products all concentrate on analysis rather than action.

Knowledge-based systems will eventually solve this problem. Currently, however, a performance analyst needs to deduce reasons for poor performance, and a network technician is needed to implement the relevant changes.

Taking steps

Although the prospects for solving the performance puzzle may seem gloomy for the average MIS organization, steps can be taken that will help firms meet the dual requirements of network growth and performance maintenance.

One of these measures is to clearly define computing standards, both hardware and software, and enforce strict adherence to them. Companies must devise standards with the knowledge that micros and mid-range systems will become an integral part of tomorrow's network.

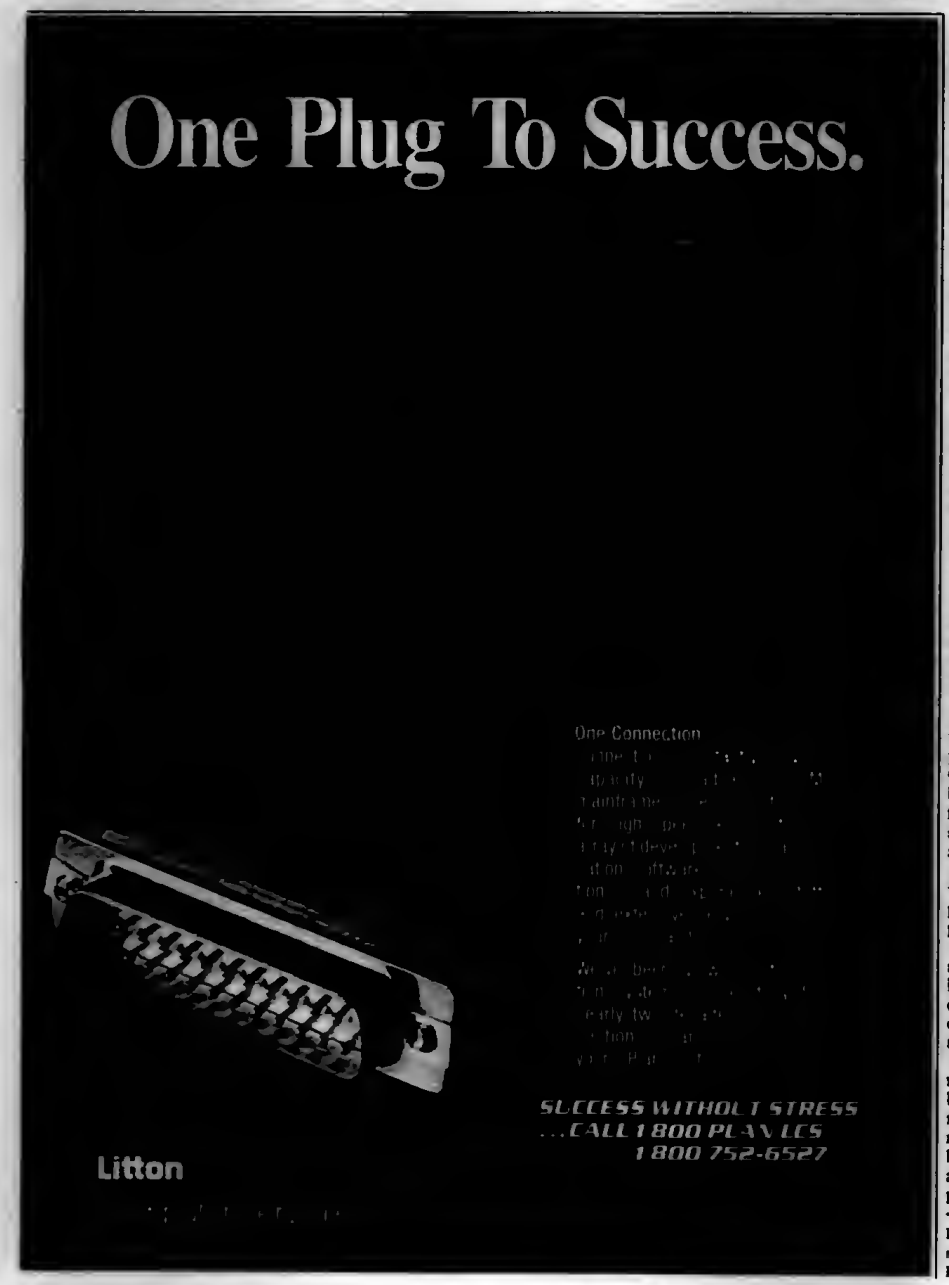
It may also be advisable, at least for now, to stick to the straight and narrow pathways. IBM and Digital Equipment Corp., along with other vendors, have been fairly open in their strategic plans for network offerings. Blazing trails by installing proprietary network solutions is an ill-advised strategy.

Software performance engineering, the study of the design effects of new applications and their performance, is a promising route.

Performing a formal capacity planning study on the network will help companies better prepare for new work loads and increased end-user demands. One technology that offers much hope is the expert system.

The real goal is to have a system that not only monitors network performance but generates findings in the form of dynamic network performance improvements. This would greatly reduce the skill level needed by the performance analyst and would result in improved network performance. •

Marinstein is marketing manager for the Performance Group at Computer Associates International, Inc. in Garden City, N.Y.





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Mar. 14	DBMS	Feb. 26	
▶ Mar. 28	Micro-to-Host Links	Mar. 11	WCC/Interface
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July 25	Productivity Software	July 8	
Aug. 8	TBA	July 22	
Aug. 29	DB2 Market	Aug. 12	
Sept. 19	Hardware Roundup: Large, Medium Scale & Special Purpose Systems	Sept. 2	
Sept. 26	Hardware Roundup: Small Scale Systems	Sept. 9	TCA
Oct. 3	Hardware Roundup: Personal Computers & Workstations	Sept. 18	
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Oct. 31	Unix	Oct. 14	
Nov. 14	TBA	Oct. 28	Comdex Fall
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NEW PRODUCTS

Data storage

National Advanced Systems (NAS), a subsidiary of National Semiconductor Corp., has announced enhanced versions of its **7900 Semiconductor Disk Storage Subsystems.**

The product is a solid-state storage device that emulates rotating disks. New models include the 7900-4, with a 7970-4 control unit and 7990-4M storage unit. The 7990-4M comes in configurations of 32M, 64M, 128M and 256M bytes per device. Maximum capacity per string is 1G byte.

The 7900-4 supports up to eight logical volumes per storage unit. A variable volume feature allows the customer to designate logical volume size in 1M-byte increments. The device also offers single, dual or quad porting.

The 7900-4 costs $456,500 for a 256M-byte configuration.

NAS, P.O. Box 54996, 750 Central Expwy., Santa Clara, Calif. 95054. 408-970-1000.

Terminals

A bar-code terminal designed for use in keyless data entry applications has been announced by **Burr-Brown Corp.**

The **TM4100** features a scannable



The TM4100 *bar-code terminal*

keyboard, a 16-char. LCD and a 200-char. buffer. Inputs from laser scanners, slot readers and bar-code wands are accepted. Also featured are a built-in wand holder and an audible tone that acknowledges input. The terminal includes an RS-232 auxiliary serial port and a choice of RS-232 or RS-422 for the host communications port.

The TM4100 is priced at $695.

Burr-Brown, P.O. Box 11400, Tucson, Ariz. 85734. 602-746-1111.

Printers/Plotters

Two electrostatic monochrome plotting systems, designated the **8500 Series**, have been announced by **Versatec**, a Xerox Corp. company.

The products accept 906 and 907 as well as Hewlett Packard Co.'s HP Graphics Language (HPGL) data format. The 8524 model plots on 24-in.-wide media, and the 8536 model plots on 36-in.-wide media. Both plot with 200 point/in. resolution at 1 in./sec.

The plotters feature integrated rasterizers that accept an unlimited number of vectors, the vendor said. Other features include plot scaling, 90-degree plot rotation, mirror imaging and variable line widths. The RS-232C serial interface accepts vector data at rates up to 38.4K bit/sec. A Genicom Corp. Centronics-type parallel interface can be used as well.

The 8524 costs $19,900; the 8536 costs $24,900.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051. 408-988-2800.

An ion page printer for use with IBM mainframes has been announced by **General Business Technology, Inc.**

Called the **GBT 6640**, the nonimpact printer emulates the IBM 3211 or 3205



The GBT 6640 *ion page printer*

Model 5. In addition, it provides direct channel attach to the IBM 9370 and 4300 series.

The printer offers a print speed of 30 page/min and a resolution of 300 by 300 dot/in.

The GBT 6640 uses standard letter 8½- by 11-in. or legal 8½- by 14-in. cut-sheet paper. According to the vendor, output can be in either portrait or landscape format.

Other features include eight fonts — each with 96 characters — and 32 graphic char., 500 dual-sheet input feeders and program- and operator-selectable page orientation, fonts, line/in., char./line, number of copies and I/O feeder, the vendor said.

The GBT 6640 costs $23,995.

General Business Technology, 1891 McGaw Ave., Irvine, Calif. 92714. 714-261-1891.

Xerox Corp. has enhanced its 10 page/min **4045 Laser CP** Model 100 series printers.

According to the vendor, enhancements include expanded paper handling capabilities, such as an optional two-tray 500 sheet feeder/stacker accessory; 1M byte of standard memory, expandable to 2M bytes; and an increased print volume to a design centerline of 15,000 page/month.

Prices for the Model 100 series start at $4,995.

The feeder/stacker accessory costs $1,295 when ordered with a 100 series printer.

However, the feeder/stacker costs $1,495 when ordered for a previously installed model.

Xerox, 101 Continental Blvd., El Segundo, Calif. 90245. 213-333-7000.

A Tempest-compatible color dot matrix printer has been introduced by **North Atlantic Industries, Inc.**

The **Tempest P5-T** printer provides letter-quality printing at 100 char./sec. and draft-quality printing at 290 char./sec.

It features 16 resident fonts and seven-color capability.

The North Atlantic Tempest P5-T printer is priced at $3,625.

North Atlantic Industries, 60 Plant Ave., Hauppauge, N.Y. 11788. 212-242-0000.

A nonimpact printer that emulates IBM's 3203 Model 5 printer has been announced by **Memorex Corp.**

The **4780** uses the ion-deposition process. It prints at 80 page/min and provides 240 by 240 dot/in. resolution. In addition, a built-in two-up option allows printing of two page images on a single sheet in a condensed font. Users may select from a library of more than 100 fonts, and up to eight fonts can be mixed per line or page.

The 4780 operates on-line to an IBM or compatible mainframe via either an external or built-in controller. A dual-input feeder holds up to 2,000 sheets; the output stacker, with job separation, holds 1,500 sheets.

The 4780 costs $65,000.

Memorex, 611 S. Milpitas Blvd., Milpitas, Calif. 95035. 408-957-1000.

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Executive information systems make life easy for the lucky few

Is your top management data-rich, information-poor and starving for knowledge?

BY MARY LOU JORDAN

State-of-the-art executive information systems (EIS) accommodate the most critical need of any executive: timely information that does not take long to collect or understand. A well-designed EIS can give executives the power to excel in a competitive world.

To a novice end user — which includes many senior executives — having a personal computer is not always an opportunity to explore avenues of computing. Instead, it can be the beginning of a short exercise that ends with the user having the PC removed in order to "get back to real business." Instead of user-friendly interfaces, EIS must have user-seductive interfaces.

An EIS is not merely a decision support system with a different name; rather, it is defined by user interface issues — how far the vendor has gone to see that the interface can be easily used by a nontechnical user.

According to consultant James Martin, "An EIS must package information elegantly and make it easily explorable." Martin says touch screens are one approach with obvious appeal.

What's happening?

Furthermore, an EIS is distinguished from a decision support system in its "what-is" characteristic. An EIS answers questions such as, "What is happening now to my company?" or "What is happening in the marketplace now?" Decision support systems, designed largely for projections and modeling, have a "what-if" nature.

EIS help the executive evaluate what is happening at present by using time-series data to show trends and put figures in context. The systems also integrate external information into an executive's workday. Because of their democratic approach to data, EIS are particularly suited to incorporating information such as government statistics, stock market data and marketing issues from various sources.

To succeed in its information goal, an up-to-date EIS requires a fully loaded PC or workstation, using a mouse or touch screen and enhanced graphics. And the more hard-disk storage the system has, the better.

Beyond hardware, the most successful EIS employ state-of-the-art software that allows executives to use pop-up or pull-down menus rather than type at the keyboard to interact with the system. Integrated text and graphics as well as charts and spreadsheet-style reports should appear together on the screen. Signing on and off and printing graphs, charts and reports should be fast and easy.

EIS software must be able to display a variety of preset reports and allow the user to create personalized reports quickly.

Peter Radford, vice-president of planning for National Westminster Bank USA in Manhattan, says, "It's a hazardous exercise. You really have to give [users] a tremendous amount of flexibility while at the same time providing them with access to a tremendous amount of information." National Westminster uses Execucom Systems Corp.'s IFPS software.



LEE COREY

Quick response

State-of-the-art EIS software can, on short notice, get a summary of any data the company has in its corporate data base to replace stacks of printed reports. But it is not enough to merely replace paper reports with electronic copies. An executive must be able to reconfigure reports as well as create new ones as conditions change. An EIS's ability to accomplish this task quickly and intuitively is crucial to its success.

Making computers palatable to top officials is one goal of all EIS, and ease of use plays a key role in their acceptance. Retrieving useful information is positive feedback for even the most technophobic executive.

"The executive user interface is extremely easy," says Bradford Ross, project manager of CIS/Boss business operations at Grumman Data Systems Division in Woodbury, N.Y. His company uses Comshare, Inc.'s Commander EIS.

"I spend 10 minutes showing an executive the mechanics of using a mouse or using a touch screen, and that's the training," Ross says. "Training for executives is more involved with familiarizing them with what's available than the actual mechanics of using the system."

Proficiency for executives depends on the proficiency of the system to bring up reports, graph data into reports, zoom in on key figures for more elaborate detail and move through a feast of already prepared reports and graphics at the touch

Continued on page 55

Jordan is a free-lance writer and editor based in Arlington, Mass.

- **Strategic *and* tactical systems**
- **'User-seductive' interfaces needed**
- **More than decision support**



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Pick and choose

Following is a sampling of executive information systems (EIS) products. They meet the criteria of user-friendliness and efficiency demanded by executives and are able to answer the "what-is" questions executives are likely to pose.

• **Comshare, Inc.** This Ann Arbor, Mich., company sells Commander EIS, which runs on heavily loaded personal computers and connects with IBM and Digital Equipment Corp. mainframes.

This system has four modules. The main EIS module provides the types of reports and charts that executives use regularly. In addition, there is an exception reporting module, one to provide access to the Dow Jones News/Retrieval service and a module called Execu-View for querying against mainframe data bases.

Commander EIS's user interface is graphical, with pop-up menus in a windowing system. Color is used extensively, both in charts and to highlight reports or text. The system also uses zooming, allowing users to select an item from a report, then bring up the detailed information behind it by clicking on that item.

IBM mainframe prices for Commander EIS range from $89,500 to $152,000. With Execu-View, the cost is $135,000 to $245,000.

• **Corporate Class Software, Inc.** This New York-based company markets Fastar EIS, which allows executives to access internal corporate information and external data in the form of customized reports.

Fastar EIS pulls data from the company's existing financial data base and automatically updates reports based on changes made in Fastar data. Executives can access the supporting data behind any set of numbers in a report.

Interfaces and reports are built from a tool kit, which includes an icon builder, a background maker that attaches icons to a function and an application builder that links all the windows to create custom applications.

The price of $90,000 includes a $40,000 license for Fastar, support for 15 users, documentation, installation, training and consulting.

• **Metaphor Computer Systems, Inc.** Based in Mountain View, Calif., Metaphor sells a system aimed specifically at marketing managers but which may be generalized for use as an EIS. The Metaphor Computer System runs on proprietary hardware, including a workstation with an oversized high-resolution screen, a file server, a data base server and a communications server, all on a local-area network.

Metaphor's user interface is icon-based throughout, accessed by a mouse. Data is loaded into the 3.4G-byte data base server, and the system is set up to access A. C. Nielsen Co. marketing data. In addition, users can run queries directly against an IBM SQL/DS data base on an IBM mainframe using the icon interface.

A typical entry-level configuration for hardware, software, 12 workstations and all servers is $300,000. Additional workstations cost $8,000.

• **Pilot Executive Software.** This Boston-based firm sells Pilot EIS, a system that includes a development environment called Command Center and two applications, Advantage and Dimension.

Command Center data is kept on an IBM or DEC mainframe and is updated through periodic transfers of flat files from the company's transactions data base and from outside sources. The PC module sends the queries to the mainframe data base, then displays the text, graphics and reports requested.

The system offers hierarchical screen displays as well as an exception-reporting module. The user interface is menu driven, with colors to highlight text elements and figures. Pilot also offers a library of time-series charts and reports to track historical data.

Site licenses, including PC software, range from $95,000 to $155,000.

.....

The following vendors sell software products that are not strictly EIS systems but which many firms use to create their own EIS:

• **Execucom Systems Corp.** This Austin, Texas, firm sells a supplies tool kit for building EIS, with four components:

First, IFPS/Plus is an analytical engine with data management capability that accesses information from corporate data bases and loads it into its own. Its natural-language facility allows executives to ask questions such as, "Why did income go down in Quarter 3?" and get responses such as "Because sales in Region 4 decreased."

Second, the Impressionist business graphics system delivers color displays of executive-quality reports and charts. Third, Vantagepoint allows users to download and integrate data from the mainframe, review it in graphic format from the top down and then focus on any level of detail. Finally, the executive can ask questions of source data in an English-like natural query language.

The price, including IFPS/Plus, Impressionist and Vantagepoint, ranges from $40,000 to $150,000.

• **Information Resources, Inc.** Based in Chicago, this company sells PC Express. It is a fourth-generation language with an embedded EIS application that takes advantage of Mainframe Express, the company's high-end relational DBMS.

PC Express includes exception reporting, access to external data and ad hoc query modules, plus custom applications. The EIS application within PC Express contains a forms-driven interface with pop-up menus for querying mainframe data.

Mainframe Express is priced from $65,000 to $85,000. PC Express costs $1,500 per copy. The EIS application package alone, including the reports, costs from $30,000 to $40,000.

MARY LOU JORDAN

Lucky few

FROM PAGE 51

of a button or screen.

EIS can benefit MIS as well. According to Donald Zinn, a principal with consulting group Management Dynamics in Yonkers, N.Y., it is difficult to overestimate the importance of EIS in corporate information services.

MIS challenge

Zinn says EIS are "the next real challenge, the main mission for the MIS manager." He maintains that "MIS has never really been the management of information systems,. it's been data



EIS HAS "had a tremendous impact. Just in raw productivity, you can get a lot more work from the same number of people."

PETER RADFORD
NATIONAL WESTMINSTER BANK USA

processing. This is an opportunity for MIS to give manageable, actionable information to the managers and executives who need it."

Some MIS managers are reluctant to explore the possibilities of EIS, concerned that it is merely another new system that will not really benefit users and will just cause more headaches for the DP department. Yet in case after case, when MIS has held back on implementing an EIS, it has been the nontechnical managers and even executives who have gone after the systems.

In fact, National Westminster's Radford is one executive who says MIS should not be in charge of EIS at all. "You've got to own it yourself to make it work," he says. "That's not a criticism of DP shops. It's just that it's a completely different activity in terms of the goal and the focus."

Reluctant MIS professionals may be in danger of being left by the wayside, only to have to catch up after the important technology and business decisions have already been made.

Increased visibility, greater management satisfaction with MIS, exposure to leading-edge technologies — these are some of the benefits that implementing an EIS brings to an MIS professional. As Grumman's Ross puts it, "I think our organization has been looked upon as a technological leader, not only within our own company with the other divisions, but also around the country. We're being approached by other companies for advice."

The ultimate question

To put the system together successfully requires listening to users about what their needs are.

"The No. 1 thing an MIS manager should look at is what the executives need to know," says Michael Packer, president of The Mac Group, Inc., a Cambridge, Mass.-based consulting firm. "What's critical? What decisions are being made?"

It is also important to keep in mind that the needs of an executive user are going to differ from those of other users. This requirements analysis process may be the most difficult part of implementing an EIS. According to consultant Martin, "Simply asking is not good enough. You have to probe." Martin recommends methodologies such as joint planning workshops and critical success factors.

When compared with the prospect of sheaves of printed reports, EIS benefits far

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outweigh the initial investment in EIS research and data development for both the corporation and the MIS manager.

From the top

David Schmitt, EIS administrator for the Arizona Department of Transportation in Phoenix, explains: "We had a previous system, a decision support-type system, and it was not successful. One of the reasons was that instead of working directly with the executives, the planners were working with people one or several layers below them, and asking those people to speculate on what the execs wanted to see. That just doesn't work."

The department now uses Pilot Executive Software's EIS software running on a dedicated Digital Equipment Corp. Microvax host with IBM Personal Computer workstations. In preparation for this system, Schmitt says, "we had some good, close working sessions with the executives to find out exactly what they needed, the kind of information they themselves would use."

Executives can use EIS for a variety of functions, such as internal financial reports, marketing-management and integration of external sources of information into a company's overall business plan. Gathering external data from sources such as the A. C. Nielsen Co. and Dow Jones News/Retrieval service and placing it in an EIS data base helps companies combine internal and external information to measure how well their firm is doing on a larger scale.



This type of information is especially important to Gary Rinehart, manager of information technologies at San Diego Gas and Electric Co. "We first implemented world news, industry news, financial news, responsibility reporting, organizational charts — things that didn't require the attention of the executives. We're now developing more personalized applications," Rinehart says. The firm uses Pilot Executive Software's Command Center.

Of course, most organizations constantly gather this kind of information, appending it to reports or typing it into computer systems by hand. However, the backlog in MIS, combined with the difficulty of interpreting and quantifying such data without the aid of an EIS, works against this data gathering technique.

> "WE HAD close working sessions with executives to find out exactly what they needed."
>
> DAVID SCHMITT
> ARIZONA DEPARTMENT OF TRANSPORTATION

By relieving some of the applications backlog in MIS and by giving an executive information he can use quickly — and thereby avoid spending hours poring over reports — EIS give both types of managers the time to think about new approaches to problems and to use their peripheral business vision.

This wider vision can create a crucial competitive advantage. If strategic computing is defined as the type that produces a sustainable shift in market share or supernormal profitability, there are many strategic applications for EIS in marketing, financial management and investment.

In fact, an EIS, along with distributed computing, personal computing, local-area networks, decision support systems and a host of other technologies that get information to the right people at a moment's notice, can be a strategic business weapon if used aggressively to gain market share or improve profitability.

"If I were a corporate executive," Martin says, "I would absolutely want to have certain types of information at my fingertips, possibly with a PC at home, too. There would be some kinds of critical information about the company that I would want to monitor continuously.

EIS are also tactical systems because they use computing resources well and can be implemented without making major changes. Fast access to information on a firm's mainframes means connectivity not only with one or two kinds of computers but also with operating systems, data bases and file data.

Today's EIS do not demand that a company change how or where its data is stored; rather, these systems require that people feeding data into the EIS get the information fast enough for timely delivery into the system.

Beneficial presence

A company can implement an EIS and almost immediately see an improvement in the performance of senior managers and executives. Companies do not need to put a PC on everyone's desk or link all computers together in a network or even put data into data bases to realize the advantages of EIS.

The results that National Westminster's Radford sees are convincing: "It's had a tremendous impact, both qualitatively and quantitatively. Just in raw productivity, you can get a lot more work from the same number of people."

In addition, Radford says, "The kind of analysis that's done is a lot more sophisticated. [The executives] can do kinds of analysis now that were a luxury when they were just crunching through it themselves."

And these systems do not handicap a firm's ability to

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implement other technologies and strategies later. Connectivity problems will not multiply, because EIS only extract information — they don't create it. That is a plus when it comes to keeping corporate data safe.

Healthy toddler

The market for EIS is only about 3 years old. The handful of companies currently marketing EIS now target Fortune 500 companies.

International Data Corp. (IDC) in Framingham, Mass., puts EIS sales at approximately $15 million in 1986 and nearly double that in 1987. Sales are expected to reach more than $100 million by 1991, showing slow but steady growth during the next four years, according to IDC.

Newer EIS should not only be easier to use but also easier to implement. Getting a prototype of the system up and running will take less time, thereby making advocates' claims about the systems' potential more credible and reducing the work MIS has to put in.

Ted Jastrzembski, former director of the Software and Services Industry program at IDC, says Execucom is part of the new wave of EIS vendors. That firm's recent entry into the EIS field is an offering that makes use of a "black box" technology: The keyboard for the system is flat and black, with a reduced set of highly functional keys. "It looks like something that came out of the Sharper Image catalog," Jastrzembski says, "and [perception] is important in this market."

EIS allows executives to receive the information they need faster, giving them time left over to think big.

In the short term, EIS will be able to access more of a corporation's data bases without slowing the system or disturbing transaction data. The beginnings of this trend are becoming evident in systems such as Mountain View, Calif.-based Metaphor Computer Systems, Inc.'s Metaphor, which connects transparently to mainframe data bases. More vendors are expected to follow suit.

In addition, more tools will become available within EIS to enable firms to mix data transparently from a variety of sources for better integration of outside information into corporate data bases.

After all, executive users are the ones who need to look beyond the confines of the business and into general business conditions and factors.

From the corner office

In the long term, EIS should be able to access data through the transactions data base as a proliferation of different mainframe, operating environment and data base problems are solved.

"You've got to understand that executives are not going to want to see the transactions data base directly. They'll want to see some aggregation, a roll-up of it. But you still don't want to have to move it out of the environment it's in — you'll want to aggregate it in place," The Mac Group's Packer says.

Management Dynamics' Zinn says EIS will become integrated with expert systems to create a natural language interface and, possibly, inference engine-aided information systems. Opinion is still divided over the user interface that will eventually dominate, whether it will be natural language or graphics. But as time goes on, both will become faster and easier to use and implement.

Sample executive information system

Rather than a static printed report, this system provides windows into detail analysis or trend analysis



INFORMATION PROVIDED BY PILOT EXECUTIVE SOFTWARE, INC.
CW CHART

For now, though, as one of Zinn's clients puts it, executives and managers are "data-rich, information-poor and starving for knowledge." EIS allows executives to receive the information they need faster, giving them time left over to think big. They are a tactical solution that brings strategic computing power to the executive suite and corner office.

"I think it's going to really take off," consultant Martin predicts. "Every executive has information that he has to be tracking daily. When I talk to CEOs, they tell me there is certain information they've been asking [MIS] for for years and have not gotten. I think most CEOs would say that."

"When this settles down and the technology matures," he says, "This is the way everyone will do business." •

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ESS shakes up the system

BY JOHN ROCKART and DAVID DE LONG

A number of executives are using computers, with some impact on their daily operating methods. But what is the impact of these systems on their organizations?

We are quite uncertain about either the short-range or ultimate impacts because the initiation of executive support systems (ESS) in most of the sites we visited was only one of several significant changes taking place. In addition, most of the systems had been in place for a short period of time.

It was clear, however, that major changes were taking place in the organizations we saw. And in many cases, executives highlighted the role of the ESS in their progress toward managerial objectives of decreased staff levels, increased spans of control, role change or organizational change.

The presence of one or more of these managerial objectives in each case is instructive. Although a few of the impacts described to us appear to have "just happened" as a result of the ESS, most of them are the result of conscious managerial efforts along several fronts. The ESS is merely a facilitator.

Flattening the pyramid

Two related managerial objectives came up in company after company: reductions in staff and middle management and increases in span of control. Both of these impacts ultimately point toward a flattening of the organizational pyramid.

Several firms we studied implemented an ESS to help reduce staff or at least anticipated this as an impact of the system. Xerox Corp. has 600 staff and management in its corporate headquarters in Stamford, Conn. President Paul Allaire says, "We wanted to invest in technology rather than people, and as we took down the head count we had to make them more effective. In the last three years, we've achieved a 5% reduction per year in total headquarters costs."

Gillette North America's controller, Don Palmer, says he anticipated a reduction in the number of "data acquirers" — those in staff positions whose job is primarily to collect information. This function could now be done more efficiently by the ESS.

A telecommunications company executive, however, focused on the information middlemen. "There are people in this organization whose only job is to answer questions about the budget. This technology squeezes them."

Extend managerial arm

The other organizational impact facilitated by ESS is an increased span of control for managers. Due mostly to the electronic communication capabilities of ESS, examples of increased span of control are easier to find than those of reductions in staff head count, and the effect on organizational structure is more immediate.

Chief Executive Officer Ian Rolland at Lincoln National Corp. has 14 direct reports and no executive assistant. He attributes his ability to maintain such a large span of control to the ESS, particularly its electronic mail capabilities, which allow him to keep in close touch with his subordinates.

Jim Tunis, who managed ESS implementation at Lincoln National, sums up the impact of the companywide system this way: "High-level management can assimilate more information from more subordinates electronically, so the span of control of these managers is increasing."

At Xerox, Allaire also says he sees ESS changing the organization: "In lots of companies, middle management acts as a filter for information, and this causes delays. Our system allows executives to work directly with professionals and analysts without the filters."

A more definitive and consistent impact of ESS deals with the work responsibilities of staff analysts and executive secretaries. In companies like Xerox, ESS are driving the automation of performance reporting systems and speeding up the collection and processing of data.

The controller of Diversified Electronics Corp. (not the company's real name) explains the impact of ESS on his staff: "One of the objectives of the system was to make sure our staff was doing more professional work, such as analysis, and less clerical consolidation." Under the old system, financial analysts spent about 80% of their time doing clerical work and 20% analysis. "Today, those figures are about 40% clerical and 60% analysis," he says.

Ken Soha, director of the ESS project at Xerox, offers a related view: "In the future, the role of the staff will change from presenting information to adding value. Currently, at the management committee meeting, the staff provides information. But in the future, executives will be getting this same information from the system before each meeting."

Another role sometimes changed by ESS is that of the controller. Gillette's Palmer explains the change: "Because of the ESS, the controller starts to get involved in the market size, market share and productivity statistics — all sorts of things that have not been in his domain previously. You don't want to set up separate reporting arms, and the logical reporting focus is the group that's already doing reporting in the financial area."

As a result, the controller becomes much more broadly involved in the business. "He understands the interrelationships of different factors, and he really becomes the reporter, the measurer, the monitor of the business. With this much-improved information base, it's easy to become more actively involved with strategic planning issues," Palmer says.

FINANCE departments seem to be the biggest winners and losers in the poker game of power redistribution.

ESS has also changed the roles of executive secretaries, turning them more into executive assistants. At one manufacturing company, the chairman's secretary is trained on Lotus Development Corp.'s 1-2-3 and Information Builders, Inc.'s Focus to retrieve data for her boss. One vice-president at Lincoln National sees his secretary now as an administrative assistant, helping him more with budgets and maintaining data bases and doing less traditional clerical work.

Companywide change

There is an underlying sense among many executives who install ESS that these systems can be a powerful force for two types of organizational change:

- A change in business focus, sometimes affecting the whole company.
- Power shifts, altering the relative influence of functions, departments or individuals. These are often unforeseen and difficult to identify.

Companywide or departmental changes in business or strategic focus are by far the most significant type of change created by ESS. When Mike Jensen became president of Banco Internacional de Colombia, a Citicorp subsidiary, he says he found that a lot of lower level managers worked with inadequate data.

Account officers, for example, often did not know about an overdraft or major deposit, nor did they have timely knowledge of account status or profits. Through his ESS, Jensen encouraged his subordinates to become more attentive to business details.

Another example occurred in a marketing support unit at International Computers, Ltd. (ICL).

The group's director wanted to establish a quality improvement program in his organization. He had his quality manager prepare a small data base that produced 50 graphic charts each month showing the different levels of incidents (from major to minor) by product line and the time it took to resolve each incident for the customer.

The director says, "I used this in reviewing my line managers each month. This not only showed my managers that it was costing them money to carry out this level of maintenance, but they also saw the value of taking preventive steps to avoid these problems in the first place." In its first year, the average number of incidents reported by customers declined 25%.

Power redistribution

Power shifts among functional groups, departments and individuals are another type of change supported by ESS.

One vice-president of personnel contends that his ESS strengthened the perceived importance of the personnel function: "The personnel function has become recognized as one that actually does control, does know the underlying trends in and does understand the manpower position in the organization. Three years ago that would have been regarded — wrongly — as the domain of the finance function."

In general, finance departments seem to be the biggest winners and losers in the poker game of power redistribution, created by changing information flows. They either lose power — often subtly — where another department gains independence through access to its own sources of functionally critical data, or they gain strength by centralizing control over financial and performance information.

One of the best examples of a finance group gaining power through an ESS is at Diversified Electronics. There, the controller acknowledges that enhancing the reporting system created a data base that came to be regarded as the corporation's only source of performance data. The finance department's power was greatly increased vis-a-vis the divisions, since it controlled access to this data base.

Yet another kind of power shift created by ESS is the enhanced influence executives gain by monitoring individual and organizational performance through the computer.

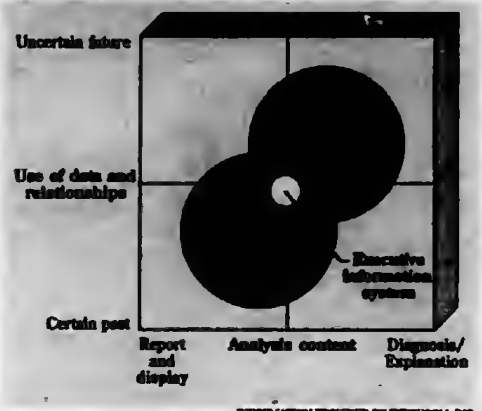
The controller at Diversified Electronics characterizes the phenomenon this way: "The system acts as sort of a 'hidden hand,' tightening up the control process by its very presence. The fact that we ask the divisions to explain variances through the ESS each month does more to control our business than anything."

Similarly, the director of ICL at one time accessed a data base of customer breakdowns to monitor the status of equipment reliability and customer attitudes.

"The chief value I got was the organization knew I was doing it," he says. "If the people below know you are taking an interest, it affects their attitude." ●

Comfortable niche

Executive information systems fill the gap between future-oriented decision support systems and fourth-generation languages, which merely report the past



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Rockart is director of the Center for Information Systems Research (CISR) at MIT's Sloan School of Management in Cambridge, Mass. De Long is a research associate at CISR. This article is excerpted from a new book, *Executive Support Systems* (Dow-Jones Irwin, Homewood, Ill.). Copyright ©1988 Dow-Jones Irwin. Reprinted by permission.



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TAKING CHARGE

Anthony Reed

A Welcome mat for DP

Most companies take a very passive attitude toward welcoming new employees.

First, a new hire spends an hour in the personnel department filling out insurance forms and getting an earful about other benefits. Next, he's taken to the medical department for a quick physical; then he's hustled to his new desk and given a terminal, a logon ID and a stack of manuals. Then he's on his own. He begins to question his decision to join this impersonal firm.

Companies can prevent this problem by establishing a formal orientation program for data processing hires.

The orientation might begin with a series of meetings with various managers, users and other staff members. A meeting with the vice-president of MIS can go a long way toward making a new employee feel welcome. Meeting people in the user, production control, operations and systems areas helps the hire associate a face with a voice on the telephone.

The nickel tour

Too often, a new employee is shown only how to get to two places — his office and the restroom. He'a expected to learn his way around the facilities. A simple tour lasting no more than an hour or so can help make him feel more comfortable. Tours of the operations area, documentation library, technical library and other points of interest will help him get his bearings.

Provide the hire with descriptions of the hardware and software configuration, productivity tools and utilities. There'a nothing more frustrating than not knowing what tools you have to work with. If the new employee sees you take pride in your facilities, he'll feel equally proud to work there.

A program that formally introduces an employee to a department's procedures, policies and standards can help make him more productive. Often, he'a given a stack of sedative manuals on the first day and left alone to read (or sleep) through them.

Prepare a list of reading ma-

Continued on page 66

Top insurers still use systems to cut costs

BY DAVID A. LUDLUM
CW STAFF

A recent study of major insurance companies suggests a continuing need to use information technology to control expenses.

Compared with less robust rivals, major insurance companies with strong profit growth in recent years boosted spending on information technology while controlling other expenses, according to the study.

The more profitable companies concentrated more information technology spending on personnel, particularly for the development of proprietary systems, while the others spent relatively more on hardware.

The study was conducted by two professors at Georgia State University's Decision Sciences Laboratory with data gathered from 40 companies from 1983 to 1986 by the Life Office Management Association in Atlanta.

The researchers assessed the intensity of investment in information technology by measuring it as a portion of all non-interest operating expenses. They measured profitability as total non-interest operating expenses as a portion of premium income.

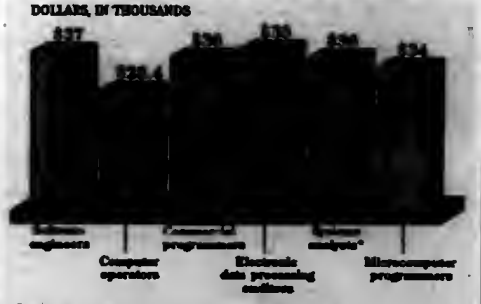
The study does not find a cause-and-effect relationship between the two but reports that a significant relationship does exist.

Continued on page 66

Data View

Professionals' pay

Median compensation of U.S. computer professionals by job function, based on 2,000 responses to a nationwide survey of professionals



*Includes project leaders and consultants

INFORMATION PROVIDED BY SOURCE EDP
CW CHART

Facing challenge

Directness, delegation mark Blue Cross exec

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Some people just love a challenge. In Geri Riegger's case, the drive is so strong that it carries over to her vacations, which have included a recent trek down the Amazon in Peru and four trips to Africa.

While not all Riegger's pastimes are quite so exotic — she also relaxes with tennis, cooking, baroque music and gardening — she is clearly not one to shy away from the unknown. Some 25 years ago, she left the relative safety of a teaching post to pioneer in what was then the almost exclusively male bastion of data processing.

Running the show

Today, after joining Empire Blue Cross/Blue Shield in 1982, Riegger controls a budget of $40 million to $50 million and oversees computing and networking departments that have a combined staff of about 300 who serve roughly 10,000 users.

Her shop boasts many large computers of the IBM 3090 variety, numerous non-IBM midrange processors and a network of 10,000 voice and data terminals as well as personal computers.

In the wilds of Manhattan, Riegger's current challenges include integrating the voice and data communications of what were once two separate insurance providers into a single, cohesive network and generally "making order out of chaos."

Joking that she likes to speak in English rather than in acronyms, Riegger says her approach to technology lies primarily in how it can be applied to the health care business. "I can be instrumental in reducing costs and making the corporation more efficient, or, in a period of expansion, I can increase revenues by using technology as the basis of new products," she says.

Riegger certainly shines in cost management, colleagues say. Her biggest achievement while at Empire, she agrees, has been improving the level of service to customers. "It almost took the [whole] five years, and we did it while reducing the cost per transaction," she says, noting that service improvements

Continued on page 64

PROFILE
Geri Riegger



***Position:** Vice-president of Information Services Division, Empire Blue Cross/Blue Shield*
***Mission:** Meeting business needs by defining clear goals, utilizing strategies and directing her organization toward them*

Weyerhaeuser spins off another DP business unit

BY KATHY CHIN LEONG
CW STAFF

TACOMA, Wash. — Ten years ago, Weyerhaeuser Co. developed a software product that allowed workers to cut more lumber from the company's forests without cutting down more trees.

Now the nation's second largest seller of wood and paper products has decided to share its money-saving software secrets by launching Innovis Interactive Technologies.

According to President Mark Lembersky, the goal of the start-up firm is to provide interactive decision-making tools to help nontechnical employees contribute to a company's bottom line. "We have been besieged by other institutions to provide similar kinds of products for them. The best way to do it was to set up a company," he said.

Innovis is the company's second technology-based subsidiary. In 1986, it launched Weyerhaeuser Information Services, a unit that provides data processing and disaster recovery services for both Weyerhaeuser companies and outside businesses. Innovis will follow suit in offering software to sister companies and non-Weyerhaeuser customers.

Weyerhaeuser is one of a growing number of users of information technology that have branched out to provide data processing products and services to others. Companies such as Eastman Kodak Co., Bankamerica Corp. and Bechtel Group, Inc. have been in the computer and software services market for a number of years.

Double vision?

Innovis now offers two software products: Vision, the program for cutting trees more efficiently, and Desktop Building, a product intended to offer commercial property owners structural overviews of buildings. While Desktop Building does not provide the engineering detail of computer-aided design packages, it helps users decide what architectural features would be most cost-effective to build.

Vision is sold directly to the general market in a personal computer version for $350. More sophisticated modules that operate on Silicon Graphics, Inc. computers for three-dimensional capabilities reportedly will cost from $2,000 to $150,000.

Desktop Building will be offered exclusively to the Weyerhaeuser Building Systems unit, according to Lembersky. "That company will be offering [Desktop Building] as part of their service to customers," he said. "This is how we will typically offer our products."

Lembersky acknowledged

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Challenge

CONTINUED FROM PAGE 63

typically do not come cheap.

With her bent toward the logical and her zeal for cost control, it is not surprising that Riegger showed an early attraction to math and science. She began her career as a high school teacher; that lasted just one year. Unable to find a position teaching the disciplines she had studied, she switched to teaching computers, a jump she describes as a major but unplanned turning point in her career.

Riegger says she recognized the opportunities that computing, as a new industry, afforded women with the proper skills. She was right. The move led to 12 years with IBM, during which she moved from teaching to selling to product development, as well as a White House fellowship and selection as Manufacturers Hanover Trust Co.'s first female vice-president, heading up computing operations.

Getting established

Riegger says that in general, women have had a harder time at high levels, but that they often do better in computing because of the need for technical skills.

The impact of those views at Empire is subtle, however, according to Arlette Klein, a vice-president of systems and Riegger's peer. "She does not campaign from a feminist perspective, but she may have somewhat raised the consciousness of people around us in terms of what is appropriate [behavior]."

A no-nonsense, results-oriented approach on the job has helped Riegger get where she is today. While somewhat reserved — she is not a "buddy person" at work, a colleague says — Riegger is known for being direct and assertive. "She does not gild the lily or beat around the bush," a co-worker acknowledges.

"I am definitely not laid back," Riegger says with a laugh. "I clearly believe in setting very high standards for my organization." She adds that a staff of "leaders in their own right" makes those goals achievable.

Her job, as she sees it, is to define clear goals, set strategies and direct the attention of her organization toward the goals. "I do get involved, but how someone implements those goals is not a concern of mine," she says.

Klein concurs. She notes that Riegger is not one to drown in detail but is persistent in tracking those aspects of a project she cares about, such as costs.

Doing homework

Riegger's mix of technology and business knowledge allows her to "hold her own" in any planning or implementation environment — and a penchant for doing her homework doesn't hurt either, according to Dick DiFalco, a division vice-president and Riegger's boss.

Besides evolving from a "back room operation" in the five years since Riegger joined Empire, MIS was recently annointed a corporate function rather than a divisional one. That makes it even more important for someone in Riegger's position to be able to relate to business needs, DiFalco adds.

"Her attitude on the job is always one of: 'How does what we are doing help or hinder the business we are supposed to support?' " he says.

Riegger credits that attitude to her IBM training in marketing. "It's not enough to know technology; you have to be able sell and explain it to your customers and executive management," she says.

Adds Donald Morchower, Empire's chief information officer: "IBM does prepare people in a certain way and image. She brings that level of professionalism and organization with her."

DiFalco sums up this experience by describing Riegger as a "situation manager" — someone who can be counted on to take a project from start to finish and bring it in on time, within budget and achieve the prescribed goals.

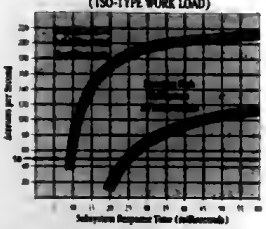
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CALENDAR

National Conference of the North American Honeywell Users. Norfolk, Va., March 6-10 — Contact: Lee Pazza, NAHU, P.O. 3037, Willingboro, N.J.

Integrated Database Management System User Association Annual Conference (IDMS 88). Orlando, Fla., March 6-10 — Contact: Kathleen Nilan, IDMS User Association, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

2nd IEEE Conference on Computer Workstations. Santa Clara, Calif., March 7-10 — Contact: Computer Society of the IEEE, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Federal Office Systems Expo (FOSE) '88. Washington, D.C., March 7-10 — Contact: Debbie Murray, National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

Ninth Annual Conference on IBM Performance/Capacity Management. Scottsdale, Ariz., Mar. 7-11 — Contact: Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

IBM Here and Now. Atlanta, March 8-9 — Contact: Automotive Industry Action Group, Suite 830, 17117 W. Nine Mile Road, Southfield, Mich. 48075.

CAP '88 West. Los Angeles, March 8-10 — Contact: Computer Aided Publishing, Inc., Suite 200, 90 W. Montgomery Ave., Rockville, Md.

Connect '88. New York, March 8-10 — Contact: Meg Mercer Young, Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

Society for Information Management Institutional Member Conference — Information Systems: The New Business Partner. Tarpon Springs, Fla., March 9-11 — Contact: Kathleen Nilan, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601

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All entries will be shown to our panel of judges, who will be tied to their chairs until selections are complete. Six winning slogans will be picked, and everyone who sent in one of those slogans will be eligible for a prize. If you are the only one submitting a particular slogan that wins, you, of course, get the prize. However, if more than one person had the same intelligent idea, we'll pick the prize winner out of a hat. Prize winners will receive a $100 certificate good towards the purchase of software from a friendly neighborhood computer store.

All decisions of the judges will be final, and no representations as to their competence, skill, or sense of humor are being made. All entries will become the property of *Computerworld*. Deadline for entries is **March 18, 1988** at our offices in Framingham, MA.

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DP unit

FROM PAGE 63

the two products are aimed at very focused markets.

While Lembersky would not elaborate on future products from the new business, other sources within the corporation said it is working on a software package designed for retail home improvement centers. The interactive graphically based software would help customers working on projects such as a backyard deck to determine what materials to buy and in what quantities.

Lembersky stressed that the company is not attempting to sell computer technology but is, rather, using computer software as the best media to sell its decision-making concepts. In the future, he suggested, the company may use optical disk technology to achieve the same results.

Lembersky related a philosophy he hopes to see carried through the product line. "I don't want to give people the sense that the computer has all the answers," he said. "The computer is a tool to help them make better decisions."

Insurers

FROM PAGE 63

That underscores the importance of using information technology to control other expenses, according to Sidney E. Harris, an author of the study now at Claremont Graduate School in California. "Don't just look at the amount you spend in relation to income, look at the amount you spend in relation to expenses," he said.

Companies should decide whether it is more critical for them to use information technology to cut costs or boost revenue, he added.

The study suggests a growing need for insurers to use technology to increase revenue. "The ability to deliver flexible investment-based products at the lowest cost has become a critical success factor for the industry," it says. "Product innovation is heavily dependent on information technology for production efficiency and for distribution and service effectiveness."

Harris said the findings should be relevant to other industries in which companies have a similar degree of reliance on information technology, including financial services, wholesale trade, health care and business services.

Reed

FROM PAGE 63

terial for the hire. If you have several volumes of standards and procedures, identify specific sections that may be relevant to his immediate needs.

Provide him with copies of the security manual and explain any penalities for violations. Show him where the technical and system utility manuals are located and identify the procedures for checking them out.

Simple steps such as these can go a long way toward making an employee feel more comfortable in his new environment and toward making make him more productive faster.

Reed is an independent quality assurance consultant in the Dallas area.

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Advanced V-band circuitry will play a key role in satellite-to-satellite communications and in the operation of spaceborne imaging array systems. Hughes is developing for the U.S. Air Force compact, reproducible, reliable transmit/receive switches and analog and digital phase shifters. The components will operate at approximately 60 GHz, the preferred range for phased array equipment in future space systems. The V-band includes frequencies from 50 to 70 GHz, and is considered the optimum frequency range for orbiting secure communications systems.

Carried aboard a new satellite, positioned to detect storms threatening the East Coast, are two experiments. The Geostationary Operational Environmental Satellite (GOES) H, designed and built by Hughes for the National Oceanic and Atmospheric Administration, includes a space environment monitor (SEM) and an experimental receiver. The SEM assesses magnetic field strength and direction, solar x-ray fluctuations, and particles in its vicinity that make up solar wind and radiation belts around the Earth. The receiver will be used to aid in international search and rescue missions by monitoring radio distress signals from troubled ships or aircraft throughout most of North and South America. GOES H is in geosynchronous orbit above the Atlantic seaboard.

A new circuit design complex will help Hughes microchip designers develop advanced radar and communications systems for military applications. The Microwave Monolithic Integrated Circuit (MMIC) Design Center will include cell libraries and computer-aided design workstations and will be located in the new gallium arsenide (GaAs) microchip production facility. Location of MMIC design and GaAs production in the same facility will benefit the design activities, as MMIC chip development requires repetitive design-processing cycles with quick turnaround. The MMIC program is designed to support all microwave and millimeter wave systems with the latest state-of-the-art technology.

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Stephen Jones

Hashing out legal rights



It might not be the hottest topic on this week's episode of television's *L.A. Law*, but the intellectual property and copyright protection of software remains an important, and as yet unresolved, issue for users and vendors in the computer industry.

Software source code, those innocuous lines of commands that make up an application, attained celebrity status during the last few years, thanks to a series of sexy lawsuits and drawn-out court battles.

At issue was how far one developer could go in copying another's software program. Any hacker is free to come up with a spreadsheet, but what if it clones the "look and feel" of

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Preletz leads recovery cavalry

Hambrecht & Quist's results man turns troubled firms upside down

BY J. A. SAVAGE
CW STAFF

MILPITAS, Calif. — Hambrecht & Quist, Inc. partner and turnaround specialist Mike Preletz says that his education at the U.S. Military Academy at West Point may have something to do with his drive to excel at the helm of no less than six high-tech companies at once.

"They have a simple method there," he said. "Learn, or they take you out and shoot you."

Superminicomputer start-up Ridge Computers, based here, is the eighth high-tech company to learn about Preletz's turnaround techniques. San Francisco-based Hambrecht & Quist, one of the computer industry's premier venture capital firms, replaced Ridge's chief executive officer with Preletz earlier this month in an effort to stanch further losses at the company. Preletz immediately axed one-half of the company's work force.

While imposing unemployment on many, Preletz has been successful in making his companies profitable.



Mike Preletz

Culver City, Calif.-based tape drive maker Rexon, Inc., for example, lost $6 million on $33.5 million in sales in fiscal 1985. In its two full fiscal years since Preletz took the helm, Rexon earned $3 million on $9.3 million. Revenue in fiscal 1987 passed the $100 million mark.

Preletz also holds the CEO position at disk drive film head maker Read-Rite Corp. in Milpitas; scientific computer vendor Adac Laboratories, also in Milpitas; Visual Technology, Inc. in Lowell, Mass.; and Zymed, Inc. in Camarillo, Calif.

Ridge customers and analysts who follow the company say the venture-funded, private company has been marred by inconsistent direction, such as starting with a proprietary Unix-like operating system and later supporting AT&T's Unix System V as well.

In various announcements in the last few years, Ridge has said it was aiming at the engineering and scientific marketplace, education, high-performance graphics and computer-aided design and manufacturing.

"We felt Ridge was directed at different markets," said Ridge customer Richard Huang, vice-president of Pacific Data Images, Inc., a firm that provides animated graphics to clients like the Super Bowl producers. "At the beginning, they didn't have Unix, and when they did, they went after the business market."

Ridge's latest product, a Unix-based 5100 superminicomputer, will be at least two months late, missing its projected February ship date, Preletz said, while the firm consults with its largest

Continued on page 70

BGS impedes Morino's buying binge

BY NELL MARGOLIS
CW STAFF

VIENNA, Va. — Between last July and last month, Morino Associates, Inc. went on the first corporate shopping spree in its 15-year history. Morino dipped into its cash kitty five times for a total of $3.4 million to acquire product lines or companies that complement its own successful information systems management support software.

But two weeks ago, Waltham, Mass.-based BGS Systems, Inc. brought the long good-buy to a halt when it rejected a friendly $27 million tender offer from Morino.

In the aftermath of the failed takeover, market observers for the most part extended condolences not to the spurned suitor but to the company that, in their view, would have done well to be bought.

"Morino's offer made a great deal of sense," said Mark Finley,

Continued on page 72

NEC seeks forfeiture of Intel's copyrights

BY JAMES A. MARTIN
CW STAFF

MOUNTAIN VIEW, Calif. — In an aggressive move to turn its luck around, NEC Electronics, Inc. last week filed a motion in U.S. District Court seeking to overthrow Intel Corp.'s copyright claims on its 8088 and 8086 microprocessors.

NEC asked U.S. District Court Judge William Gray to issue a ruling that any 8088 and 8086 copyrights claimed by Intel in four years of litigation against NEC be forfeited because of Intel's "consistent failure to take the minimum steps required by law to protect them."

"If we win this motion, the case is over," said Linnet C. Harlan, NEC counsel. "Even if microcode is deemed copyrightable, Intel still doesn't have any copyrights, because they didn't do what they were supposed to do to protect them."

NEC further claimed that Intel has allowed at least 10% of its 8088 and 8086 microprocessors to be distributed without bearing the proper copyright notices. In addition, Intel knowingly permitted its licensees to distribute "millions of parts without the required copyright notice," NEC charged.

"NEC is trying to change the focus of the case from the real issue of copyrighting microcode," said Paul Johnson, a semiconductor analyst with Shearson Lehman Hutton, Inc. in New York. "The real significance here is that NEC has become very aggressive in its defense."

The NEC-Intel legal disputes date back to 1984 and center on the issue of copyrighting microprocessor codes. Intel claims NEC's V series of microprocessors unfairly infringed Intel copyrights on the 8088 and 8086 chips.

A landmark decision in Intel's favor handed down last year was thrown out in December when U.S. District Court Judge William Ingram resigned from the case after NEC filed a motion to disqualify him because he indirectly owned a small portion of Intel stock.

Amdahl faces ESA challenge after '87 boom

BY J. A. SAVAGE
CW STAFF

SUNNYVALE, Calif. — Citing a substantial influx of traditional IBM customers and an employee training program that reduced expenses by $250 million, Amdahl Corp. announced that 1987 was "by far" its best year in business.

The company, which produces IBM-compatible mainframes and peripherals, broke the billion dollar mark in revenue last year, rising from 56% in a disappointing 1986 to $1.51 billion. Profits more than tripled from $41.8 million in 1986 to $146 million.

Soaring over Sunnyvale

Amdahl's percentage gain and decline in revenue and earnings in comparison to year-earlier quarters



INFORMATION PROVIDED BY AMDAHL CORP.
CW CHART

The revenue peak, however, was quickly overshadowed by IBM's announcement this month of a new operating system for its top-of-the-line 3090E mainframe. Such announcements often signal a dearth in mainframe sales for IBM competitors such as Amdahl that rush to simulate the product.

Not major problem

John C. Lewis, Amdahl chief executive officer, said last week that IBM ESA/370 will not cause major problems in the revenue and shipment stream because the announcement was anticipated.

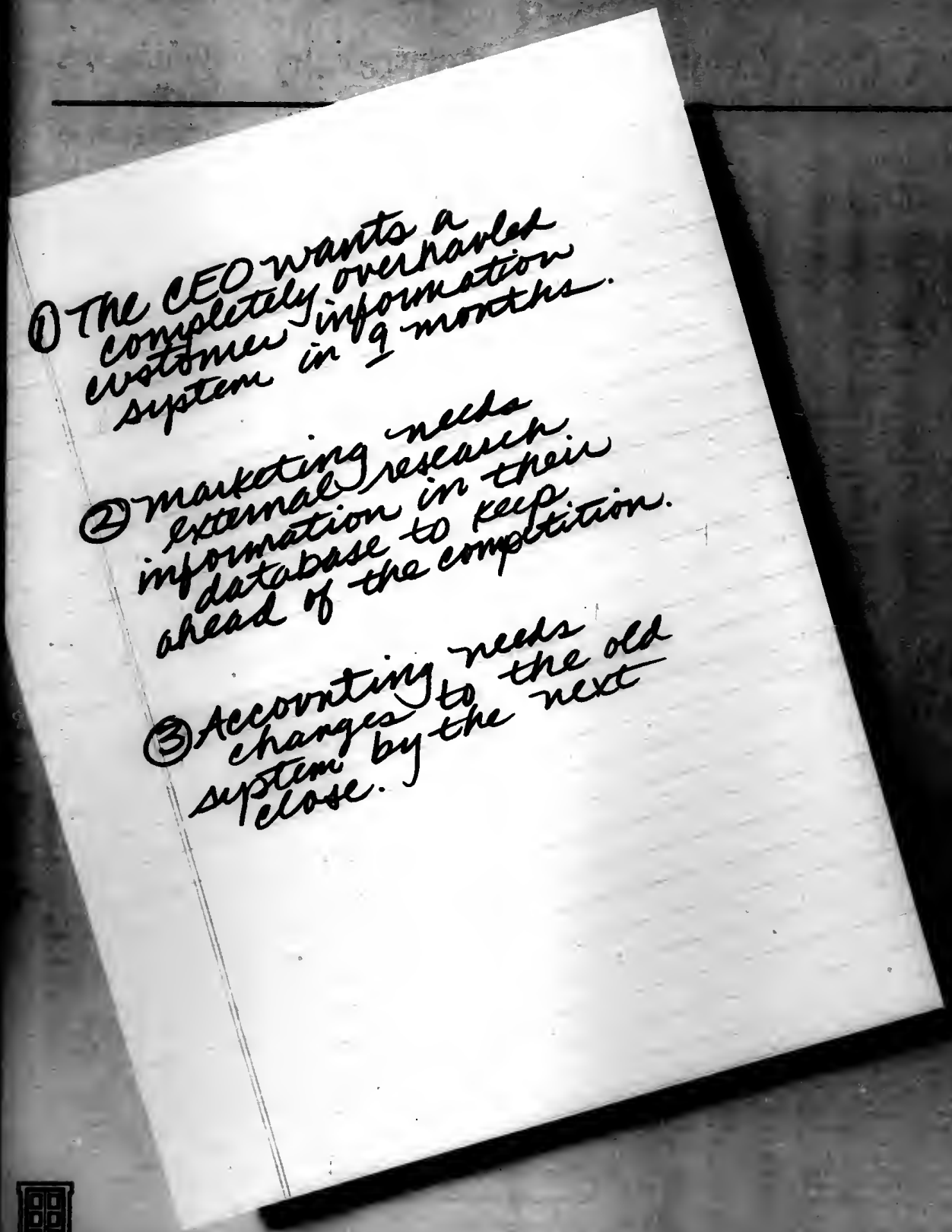
Lewis added that the hardware adaptations for Amdahl's 5890 family "will not be a major technical challenge" (see story page 1).

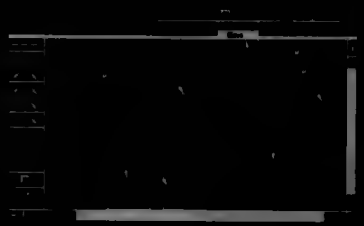
Sales of the 5890 accounts for two-thirds of the firm's total revenue, according to Amdahl.

Amdahl Chief Financial Officer Ed Thompson said Amdahl is winning market share in part because of a 400-person increase in

Continued on page 72

How Would You Deal With These Problems?





FOUNDATION

INDUSTRY WEEK IN BRIEF

Symbolics, Inc. announced the departure of cofounder and Chairman Russell Noftsker less than one month after he resigned as chief executive officer and was removed from day-to-day operations [CW, Feb. 15] of the troubled Cambridge, Mass., artificial intelligence workstation maker. Vice-President of Operations Ronald Darry was appointed to the position of president and CEO.

Software AG Systems, Inc. received an acquisition bid from its West German equity partner, Software AG. The unsolicited tender offer amounts to approximately $50 million for 78% of the Reston, Va.-based firm, as Software AG already owns 22%.

"I can't see any other buyers emerging in the U.S.," said analyst Scott Smith of Donaldson, Lufkin & Jenrette, Inc. "Software AG is one of the stocks that just hasn't come back since the Oct. 19 crash. At this point, it's worth a lot more to the West German company than it is to U.S. investors."

Although Borland International basked in the glory of a 167% quarterly revenue jump, costs related to the introduction of new products and the start-up of a company magazine caused a 46% drop in profits before taxes.

For the quarter ended Dec. 31, the Scotts Valley, Calif.-based software vendor posted revenues of $21.7 million. Profits before taxes, however, sagged to $250,000.

Dial-up modem maker Racal-Vadic, Inc. in Milpitas, Calif., has chopped 115 administrative and manufacturing staffers, or roughly 20% of its work force, as the result of a slowdown in its business and the opening of an automated manufacturing facility. This latest cutback comes on the heels of last year's withdrawal from the personal computer retail sales business when sales did not meet expectations.

JAMES DALY
AND CLINTON WILDER

Preletz

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buyer and European OEM channel, Groupe Bull in France.

Ridge was counting on the 5100, which holds 144M bytes of main memory, runs at 14 million instructions per second and supports up to 128 users, to bring it into the black. Hambrecht & Quist apparently could not wait any longer for the promised profitability.

The venture capital firm does not necessarily need an investment in a company, however, before it will take over management and attempt to make it profitable. Investors in Rexon went to Hambrecht & Quist looking for an infusion of capital last year, according to Preletz.

"If the company qualifies as good technology and it has a good marketplace, it's a potential big hit" for Hambrecht & Quist, he said. "You want to come out with a company that's worth $100 million in three or four years."

Preletz was adamant that his techniques of turnaround do not cause low morale at his companies. He said employees know when a company is doing poorly and that low morale precedes, not follows, big layoffs.

However, several employees at Ridge who were interviewed since Preletz's arrival appeared to be in low spirits. "We're trying to keep our chins up," one technical support person said. She said her department was pretty much spared of cuts because of its customer commitment.



Jones

FROM PAGE 67

the industry leader?

Athough interest in these intellectual property debates is waning among some MIS managers, it seems to be gaining momentum with an expanding group of lawyers, developers and users based in Southern California. Attracting attendees from around the world, the International Conference on Computers and Law was held earlier this month in Santa Monica, Calif., to address a number of legal issues relating to the computer industry.

Topping the list was the difficult balancing act of protecting a developer's software technology from infringement and promoting standardization and free competition in the marketplace.

Asking the courts to deliver a verdict on that issue, though, invites a number of problems. For one, the bulk of today's court systems and lawyers do not have the technical savvy to decide whether the structure, organization and sequence of source code is able to be copyrighted, said Richard Bernacchi, an attorney with Irell & Manella in Los Angeles, a member of the organizing committee for the conference.

Add to that a confusing set of precedents and several pending cases, such as Lotus's suits against Paperback Software and Mosaic Software, and you have all the makings of a major headache for the computer industry.

These problems have resulted in many intellectual property cases being decided more on the basis of legal technicalities than on an assessment of the technologies in question. In fact, most of today's copyright protection guidelines for the computer industry are modified versions of copyright principles written at a time when computers were akin to science fiction.

Heart of the matter

Bernacchi and David Nimmer, a lawyer specializing in copyright protection, have developed criteria that could go a long way toward getting at the heart of proprietary technology. The lawyers' criteria, as proposed to conference attendees, include the following:

- How much of a program's code was dictated by the type of hardware on which it runs?
- How much of the code was dictated by the hardware's operating system?
- How much of the code is needed to operate any program used in a particular application?

The idea behind these questions is to strip away generic source code and give judges and juries the bare bones of an application to which one developer claims sole possession.

Such criteria would not be needed if more companies followed Microsoft's lead in making code for products such as SQL Server and LAN Manager completely open to outside developers. But while Microsoft pursues its open architecture approach, companies like Lotus, Ashton-Tate and IBM continue to be wary of clone makers.

IBM could touch off a whole new series of legal battles on the hardware side with its proprietary Micro Channel bus architecture for the Personal System/2 line.

Developers, lawyers and users alike would do well to band together at such meetings as the computer law conference in California to hammer out the details for some clear copyright guidelines before the next explosion of litigation.

Jones is a *Computerworld* West Coast correspondent.

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Amdahl's boom

CONTINUED FROM PAGE 67

its marketing department during the last two years.

And while the bulk of new shipments are going to customers who have already bought Amdahl products, there is a significant number who have been "almost totally" IBM in the past, he said.

"Now people feel a lot safer buying Amdahl. The new saying is, 'You'll never get fired for having two suppliers,'" Thompson said, alluding to the MIS maxim, "No one ever got fired for buying IBM."

Cutting losses by increasing productivity in general administration contributed substantially to Amdahl's bottom line, according to Thompson.

"Two years ago, 35% of sales were eaten up by the cost of doing something wrong — the cost of doing something twice," Thompson said.

Training makes perfect

All employees, Thompson said, went through a training program to improve quality and eliminate duplication.

"They now speak a common language internal to the company," he said.

Amdahl's selling, general and administrative expenses dropped to 16.5% of sales last year from more than 20% in 1986, according to Joseph Payne, hardware analyst for Alex Brown & Sons, Inc. in Baltimore.

Buying binge

CONTINUED FROM PAGE 67

an analyst with the Gartner Group, Inc. in Stamford, Conn. BGS stock was selling at $6 per share when Morino made a $9-a-share cash offer for the company. The price was "what many would call generous," Finley said, "and the companies' product lines are a natural fit."

Morino offers software products and services that help companies manage IBM mainframe-based data processing, networking and application resources. BGS makes and markets modeling software used to predict the performance of medium-size to large IBM computer systems and communication networks.

Moreover, with $33.2 million in fiscal 1987 revenue, more than $6 million in profits and 300% growth during the last four years, Morino could have appealed to minority owners of BGS, which, Finley pointed out, "hasn't made operating income for one heck of a long time."

So why no deal? Although BGS Chairman, President and cofounder Harold Schwenk Jr. emphasized that "the board did carefully deliberate the Morino offer," he implied that the price was not right. "The cash behind BGS shares is in the $5-per-share range," Schwenk said. "At $9 a share, Morino was offering about $3 a share for the business — the rest amounts to cash for cash."

Speculation among market analysts centered on reluctance of the three BGS founders, who together still hold 60% of the company's stock, to give up their entrepreneurial positions.

"This is an example of the golden rule: He who has the gold makes the rules," Finley said. "The company belongs to B, G and S [the initials of the cofounders' surnames]; if they don't want to sell, they don't have to."

Morino's decision to grow through acquisition, according to founder and President Mario Morino, inevitably grew out of the company's "mission to become known as the company that can put in and support your whole information systems management support system. No single vendor can do it."

Put money where mouth is

Within weeks after announcing the intent to embark on a five-point acquisition and alliance strategy to complement continued internal development, Morino began putting its money where its mouth was. In quick succession, the company made the following purchases:

- A $1.5 million equity investment in Westboro, Mass.-based change management software vendor Business Software Technology.
- The Resource Inventory Manager line of inventory and asset management software from Unisoftware, Inc. for $600,000.
- The $450,000 acquisition of an inventory and asset management software product from Dallas-based Bendata Management Systems.
- The intended $800,000 acquisition of Lexington, Mass.-based American Management Co. This pending deal, if consummated, will give Morino its first presence in the Digital Equipment Corp. VAX systems management market for a relatively small entry price.
- An $85,000 equity investment in Elan Software Products, Inc. in San Jose, Calif., whose products improve operator productivity and automate operations in IBM mainframe environments.

"What Morino is doing is very smart," said Ken Kolence, an independent industry consultant based in Palo Alto, Calif. Unlike competitors, who see information systems management software as unrelated utility packages, "Mario views this as an overall application," he said.

Where will the firm's strategy go without BGS? Onward, according to Morino.

While declaring that his company was disappointed by BGS's decision, Morino said that "modeling is important in what we're trying to do, but not critical." Moreover, "we already have a cooperative support agreement in place with BGS" — an agreement that Schwenk said BGS definitely will support.

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COMPUTER CAREERS

Planners move out of back room

Communications, business skills the keys to capacity planning

BY MICHAEL BALL
SPECIAL TO CW



At Security Pacific Automation Co. in Glendale, Calif., capacity planning is more than just a stepping stone on the way to the top of MIS.

Gerald Hodge, manager of computer performance evaluation, oversees a staff of 24 operations and applications professionals involved in planning and performance functions.

"It is no exaggeration to say capacity planning is a career here," he says.

Spotlight on planning

Traditionally viewed as a low-profile technical arena, capacity planning is receiving more attention from management because of the increased complexity and cost of computer systems.

This attention is allowing professionals in the field to make a career out of a back-room function. Experienced planners are finding they must improve their business knowledge and communications skills.

At the same time, the increased sophistication of capacity planning technology may reduce the total number of planners a company requires and allow experienced professionals to concentrate on higher level tasks.

"Products today don't just give you data; they tell you what to do," says capacity planning consultant Ken Kolence of Kolence Associates in Palo Alto, Calif.

In the future, these products will encompass both artificial intelligence and modeling techniques as well as a blend of computer-aided software development and capacity planning.

Ultimately, companies will no longer need to teach new MIS professionals all the rudiments of the field.

"We're going to be less demanding on our people as a result," Kolence says.

Career glamour

At Coldwell Banker Residential Group in Laguna Hills, Calif., a higher profile for the capacity planning staff makes positions within the section more attractive to MIS professionals, says Jason Shane, manager of national capacity planning.

The key to management's recognition of capacity planning, Shane says, is staffing the section with competent professionals who possess an extra set of communications skills.

"I am a technician and I will die one, but if our systems planners cannot deal with executives, the message is lost," Shane says.

Shane looks to hire professionals with computer expertise and oral and written communications skills.

> "I VIEW THE capacity planner as a liaison between MIS and business planning. The technical skills are secondary. I would take business analysts and train them in systems."
>
> JASON SHANE
> COLDWELL BANKER
> RESIDENTIAL GROUP

"I view the capacity planner as a liaison between MIS and business planning," Shane says. "The technical skills are secondary. If I had the money to do so, I would take business analysts and train them in systems."

Security Pacific's Hodge also wants to make capacity planning a career varied enough to keep people developing professionally.

To achieve this goal, Security Pacific funds internal and external education, and Hodge's managers are always exchanging duties.

"We make sure that skills cross-training is part of the job," Hodge adds.

Professionals enter Security Pacific's capacity planning and performance functions from the applications and operations areas of MIS. "It takes about a year or longer for them to teach each other the other side," Hodge says.

After this period, a person is ready for something else, Hodge says. Depending on the employee's interests and abilities, that something is likely to be a stint with a measurement team of four, perhaps monitoring and helping manage operating system performance. Finally, when those skills are mastered, and the MIS professional is ready for a new challenge, "then we go into actual capacity planning," Hodge says.

Rather than purchase technology as it becomes available, Hodge relies more heavily on the staff already in place.

"The tools are definitely becoming enriched," he says, "but we are not necessarily buying a shiny new tool unless it definitely does something we're not already doing."

In terms of recruiting, Hodge looks for a strong systems programmer, one who knows the systems internals specific to the firm's operation. But this person must also possess a real interest in performance or capacity.

"We want someone who will do more than take the data off the screen and look at the book to see what it means," Hodge says. "The person we hire will be the one who says, 'The interesting thing about this number is that it is only collected at this time, so it's skewed.' "

Hodge may hire someone without a performance track record and pay them in the low- to mid-$40,000 range.

"But we can go substantially higher for a truly established professional," he says.

Experienced planners rare

However, Hodge says he rarely finds a highly experienced capacity planner and does not always hire the ones he does meet. "We have to be careful, because some experienced people are not able to look at the job with fresh eyes," he says.

According to Hodge, his staff seems to thrive on the demands and the constantly varying duties.

"If a person has a job and doesn't think every once in a while, 'Why don't I just go and dig ditches?' — then the job probably isn't challenging enough," Hodge says. "This one is."

Ball is a free-lance writer based in Boston.

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- Command-Level CICS
- IDMS & related products

☐ Programmers for System 3X environments. Experience to include:
- 2-3 years' RPG programming
- MAPICS highly desirable
- PC exposure helpful

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If you missed the opportunity to dial us directly on January 24th, then here's another chance to take advantage of our DP Opportunities Hotline. Excellent positions are still available in a variety of areas. By dialing our number you'll gain access to a very exclusive multiple IBM 3090 environment. But only if you're as committed to progress as we are at Fireman's Fund.

Exactly how advanced are we? Well, the fact that IBM currently features us in their own product advertising speaks strongly for our ability to select and cultivate technology, and where we're going is even further ahead. We have made a 48 million dollar project commitment for 1988 to continue the development of our nationwide business information processing network. You'll find a range of challenges here involving IMS DB/DC, DB2 and CICS in an MVS/XA, VM/SF, VM/HPO and VTAM environment. But above all you'll find commitment and a team dedicated to building value for the future. Ours. And yours.

DP Opportunities Hotline:
Call COLLECT 415/492-6439
Sunday, March 6
10 a.m. to 4 p.m. (Pac. Std. Time)

DESIGN/SR. PROGRAMMERS
Five or more years programming experience, 2 of which include experience with IMS DB/DC. A thorough understanding of COBOL, structured design and programming essential. For design positions, project leadership and planning experience required. Familiarity with DB2, JCL, Yourdan or Gane/Sarson structured methodologies preferred.

SYSTEMS ANALYST SPECIALISTS
12+ years of data processing experience in large scale IMS analysis, design and development with expertise in IMS DB/DC, structured methodologies and design, structured tools/techniques, data base considerations, data modeling, data dictionary and project management and planning. DB2 and/or SAS highly desirable.

LEAD/SR. SYSTEMS ANALYSTS
At least 5 years analysis/programming experience with on-line applications; an in-depth understanding of structured design/analysis techniques, a background in IMS development systems are essential for these assignments. Advanced level positions also require previous project leadership experience. DB2 would be a plus.

LEAD/SR. EQUIPMENT PLANNERS
Assume responsibility for capacity planning, cost value analysis, configuration analysis and design. Five or more years equipment planning experience and a thorough understanding of IBM Sys 370 architecture are required.

TELECOMMUNICATIONS MANAGER & SR. ANALYSTS
A thorough understanding of IBM SNA environment to design and implement large-scale, nationwide data communications networks is required. Will also evaluate and plan the implementation of voice/data products and services which requires excellent analytical, project management, and communication skills. 3-5 years directly related experience with vendors such as AT&T, IBM/ROLM, Northern Telecom, MCI are essential. Additional experience should include ACD's and voice messaging systems plus a strong understanding of the current regulatory environment. Management position requires an additional 2-3 years experience in a supervisory capacity with a strong emphasis on strategic planning.

Our systems operations are ideally located in Northern California's Marin County. In fact San Rafael and Novato, our major sites, recently topped The San Francisco Chronicle's list of "best places to live" in the Bay Area.

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If you miss the March 6 Call-in, please forward your resume indicating position of interest to: **Fireman's Fund Insurance Companies, Systems Division, Central Employment Services, Job #SYS7, 4040 Civic Center Dr., San Rafael, CA 94912.** An equal opportunity employer. Principals only, please.

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COMPUTER SYSTEMS ENGINEER

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This individual will provide technical support and has responsibilities for the continuous operation of Haworth's CICS systems including IMS/DB support. Support duties include planning, designing, installing, performance tuning and maintaining systems software. This individual will also provide consultation, technical problem-solving, and debugging services for persons in other areas of MIS.

Haworth's computing environment consists of an IBM 3090-200E running MVS/XA, JES2, VTAM, TSO/E, ISPF, CICS, IMS/DB, DB2, DISOSS, PS/CICS as well as many other state-of-the-art software systems.

The ideal candidate will possess a Bachelor's degree in computer science or related technical field or equivalent with 4 to 6 years experience in systems software. A demonstrated competence in one computer language and an in-depth understanding of CICS are also required.

We urge you to investigate this opportunity. The addition of your individual talent, skills, education and goals will help assure our mutual success. For immediate consideration, please send your resume including salary history in confidence to:

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System Vice President for Computer Services

The University of South Carolina invites applications and nominations for the position of System Vice President for Computer Services. The University is a nine-campus System with a total enrollment of over 37,000 including 15,000 undergraduates and 8,600 graduate students on the USC-Columbia campus. Columbia is the state capital and the geographic, economic, and cultural center of the state with a metropolitan population of over 453,000.

The System Vice President for Computer Services reports to the President and has responsibility for providing technological resources to the nine campuses of the University System and to over 75 governmental agencies. He or she will establish the technical direction and policy for supporting research, instructional, and administrative needs of all and users and for developing the University's new parallel supercomputing system.

The Computer Services Division consists of over 200 employees responsible for several mainframe systems supporting a data network of over 1,500 terminals plus a video network of over 70,000 stations. In addition, distributed minicomputers and numerous microcomputer systems require substantial effort.

To provide effective leadership, the candidate should have a college degree with formal training in technology, an appropriate combination of academic and administrative computing and technological experience and a record of accomplishment in leading and managing in a complex and decentralized environment of both internal and external user expectations.

Applications and nominations will be accepted until April 15, 1988 or until the position is filled. The position will be filled on or about July 1, 1988. Applicants should submit a resume with a brief letter of application to:

Dr. James R. Davis, Chairman
System Vice President for Computer Services Search Committee
College of Science and Mathematics
University of South Carolina
Columbia, SC 29208

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Heritage Computer Corporation is seeking a Director for programming staff. We are a state-of-the-art developer and marketer of IBM mainframe hardware for the property/casualty insurance industry. This Sheboygan based position will be responsible for R&D, product construction, client support activities, hiring and training of staff.

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(2 positions)
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Bachelor's degree required, advanced degree preferred. Minimum of 2-3 years progressive programming and analytical experience (or equivalent in education and experience) essential. Also required are experience in an IBM environment, experience with PL/1, IBM assembler and JCL, and excellent communication and documentation skills. Knowledge of MVS, VSAM, CICS, VM/CMS, IBM 3270 terminal communication, ADABAS, COM-PLETE or library bibliographic applications desirable. The senior Analyst/Programmer must have ability or work independently and or take primary responsibility for production applications.

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Send resume, listing 3 references, to: Kathleen Williams, Director of Personnel, Box 26 Butler Library, Columbia University, 535 West 114th Street, New York, NY 10027. Deadline for applications is March 15, 1988.

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Five years experience with VAX equipment, and associated higher order language operating systems, three years experience with a major relational database such as INGRES or ORACLE, and two years experience as a Project Manager of a major ADP support program, BS in Computer Science or related field required.

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COMPUTER SOFTWARE SPECIALIST

Minimum Qualifications: Bachelor's degree in Computer Science/Business Administration related field or equivalent experience. 5 - 7 years mainframe DP/Computer related experience; not db, 4GL and COBOL Programming Languages, systems development, analysis and design, project control, knowledge of SAS, SPSS/, or DYL280, human relations.

Responsibilities: System design and development support, leadership capability and purchased software selection and implementation for administrative application. Supervise Programmer/Analyst(s). Salary: $25,000 - $31,000.

MANAGER, INFORMATION CENTER

Minimum Qualifications: Bachelor's degree required. Prefer degree in computer related area, however, could substitute a combination of degree in a less technical area and relevant experience. Three years experience in a university computing environment. Several years experience in Human Resources Management required, supervisory experience and ability to manage/direct professional staff.

Responsibilities: Coordinate Information Center activities necessary or to promote computer self-sufficiency of University personnel. Counsel/advise all University departments, including faculty and administrative staff. Salary: $28,000 - $32,000.

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Send letter of application and resume to Joan Harris, UCLS, Haning Hall, Ohio University, Athens, Ohio 45701 by March 25, 1988.

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#8-048

Requires Bachelor's degree in computer science with coursework in mathematics and statistics and three years of increasingly responsible experience in the development of data processing systems and programming. Must have working knowledge of the VM/CMS operating system and PL/I, Fortran, BASIC, REXX, IFS, and DMS, as used under the VM/CMS operating system. Knowledge of the VSAM file access method and Linke 1-2-3 and dBase II essential. Prefer strong mathematics and statistical background, data processing experience in a scientific setting. Prefer experience in data processing and statistical consulting with grant and contract writing. Prefer experience in data processing and statistical consulting with grant and contract writing. Position skills. SALARY: $1,981 - $2,622. DEADLINE: March 24, 1988. Send letter of application and resume to Jon Jorstein North Dakota, Attn: Greg Krueger, PO Box 1537, Grand Forks, ND 58206.

Knowledge Engineer - Assess feasibility of artificial intelligence (AI) applications; design, develop, program & organize services relating to AI projects. Requires PhD in Computer Science. Grad level program must have included courses or research: 1. in CAD-CAM technology, CAD/Solids Modeling, computer aided analysis, NC programming, process planning & control, robotic systems & FMS; 2. in utilizing Lisp programming & at least one major knowledge Engineering tool (ART, KEE, KNOWLEDGE CRAFT) in developing AI solutions within manufacturing industry & in the development of AI applications to support the mfg planning activity; & 3. in the application of AI to process planning. Job site & interviews: Dearborn, MI. 40 hrs/wk, Mon-Fri; salary: $1657.38/wk. Send resume to 7210 Woodward Ave, Rm 415, Detroit, MI 48202. Ref. #1888. "Employer Paid Ad"

SOFTWARE ENGINEER: Work on computer development for UNIX & other OS's. Design, code & application of compiling development technologies. Implementation of software to partner & user level. Development of the run time system & of additional system administrative. Systems & programs in C & UNIX. Knowledge of MS-DOS & its environments on use of "C" language. Must know theory & implementation of compilers, operating system technologies, computer architecture & real time applications. C, FORTRAN, PASCAL, Assembler & UNIX & other os. Work both on VMS & MS-DOS. Bachelor's - Computer Science. $ 30K - $40,000/yr, 40 hr wk. Send resume: Data #7780, Advanced Computer Technology Corp., 16 E. 34 St., New York, NY 10016.

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Room 54, Holland Building
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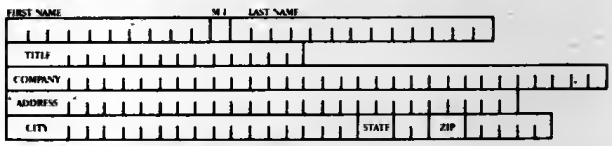
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- 03. Dir. Mgr. Supvr., Analyst, of Systems
- 01. Dir. Mgr. Supvr., of Programming
- 03. Programmer, Methods Analyst
- 06. Dir. Mgr. Supvr., OA/WP
- 09. Data Comm. Network/Systems Mgr.

OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner General Mgr
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- 13. Treasurer, Controller, Financial Officer
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03. Dir. Mgr. Supvr., Analyst, of Systems
01. Dir. Mgr. Supvr., of Programming
03. Programmer, Methods Analyst
06. Dir. Mgr. Supvr., OA/WP
09. Data Comm. Network/Systems Mgr.

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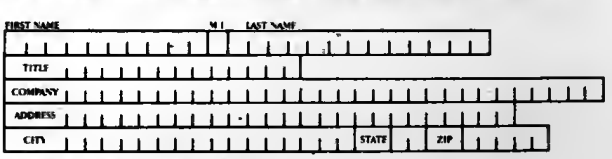
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98. Others _____

(Please specify)

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We are seeking an aggressive, career-oriented individual to serve as a top systems executive. The successful candidate will have extensive and diversified business experience with emphasis in the management of high-quality, cost-effective computer and communications services which respond to business opportunities, plans, and problems. The ability to direct a rapidly growing state-of-the-art computer complex (30XX under MVS/XA and SNA/SDLC, Tandem OLTP), and network engineering/systems software activities is essential. Experience with the application of front-end processing to manage a series of interconnecting telecommunications networks, e.g. local access networks, "800" dial-up services, terrestrial networks, value-added networks and VSAT-based satellite communications is especially desirable.

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CORPORATE R&D

SR. SOFTWARE ENGINEERS

The primary responsibility for each of these positions is the technology transfer of software engineering research throughout the corporation. The transfer will be accomplished through consulting and training; activities include reviewing current standards and practices, helping to establish new programs, and delivering selected training courses in areas of software quality and metrics. In addition, there is an opportunity to perform applied research in appropriate areas of software engineering.

Prior experience in one or more of the areas listed below are a pre-requisite. PhD or MS in Computer Science or Computer Engineering or equivalent is required.

- Software Metrics
- Validation/Verification Techniques
- Software Quality Assurance
- Software Testing

SR. SOFTWARE ENGINEERS

The primary responsibility of these positions is the technology transfer of applied software research within the corporation. Responsibilities include: research in software engineering methodologies and tools, design and delivery of seminars and workshops on selected software engineering topics, and consultation with Motorola software development organizations.

Requires a thorough knowledge of software engineering principles and methodologies; PhD or MS in Computer Science or Computer Engineering or equivalent. Experience in one or more of the following areas is recommended: embedded and/or real-time software, design methodologies, computer-aided software engineering, or programming environments.

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Rhode Island Hospital, a 719-bed Trauma Center affiliated with the Brown University Program in Medicine, has a challenging opportunity available for a Systems Specialist to manage the computerized information systems in our Pathology Department. Position reports to Pathologist-in-Chief and will respond to broad and diverse service requests requiring technical and practical understanding of the automated clinical information systems utilized throughout the department.

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MARKETPLACE

Used market lost in the vapor

Trading slows as resellers, end users driven away by vaporware sales

BY ELIZABETH LOZANO
BOSTON COMPUTER EXCHANGE CORP.

The market experienced a trading lull in the week ended Feb. 19, as volume sales of vaporware — used equipment offered for sale before it is truly on the block — discouraged resellers and end users alike. Despite this lack of confidence in reliable supply, however, major manufacturers' microcomputers experienced only slight decreases in value.

The IBM Personal Computer XT Model 089 closed down $25, trading at $1,725 in single-unit transactions. The PC XT Model 086 recovered after falling in value midweek to close at $1,350. The PC AT Model 099, affected by vaporware sales, brought a price of $2,325.

Both the AT Model 339 and the PC Model 076 closed up marginally. The AT Model 339 closed at $3,375, escalating in value as the official end of its production nears. The two-drive classic PC Model 076 was exchanged at $825, with an increase in demand fueling its $25 increase in value.

The big IBM news of the week was the newspaper ads for the company's new DOS machines. Major retail chains were advertising new ATs, and dealers were on the phones buying and reselling these machines for quick cash as well.

Missing: Model 339s

Are these models being phased out by retailers to make room for inventory that meets sales quota requirements? Although sources at IBM insist that the AT Model 339 is still in production, current market conditions indicate otherwise.

One major retailer stated, "I sure can't get any 339s out of IBM. I sure wish I could."

Another dealer, commenting on the events of the week, exclaimed, "I don't want what's behind door No. 1, or what's behind the curtain. I want those 339s."

In contrast to the rumors that fueled the lull of IBM transactions, used Compaq Computer Corp. equipment traded steadily, experiencing solid pricing throughout the week of Feb. 15.

The Compaq Plus was the most readily available of the Compaq line. It closed even, at $1,350, as many buyers and sellers expressed confidence in the basic hard drive portable.

The Compaq Portables II and III closed even at $1,650 and $2,725, respectively, under comparable conditions. The Portable I traded up, at $775, experiencing an increase in trading volume and demand.

The most popular of the Compaq models, the Deskpro 386, continued to be in short supply. The Deskpro 386 40M-byte model closed at $4,300, representing the most available version of these underproduced boxes.

One particular line of machines was the stabilizing factor across the Big Board, preventing the IBM rumor mill from spoiling the market. An increase in trading of Apple Computer, Inc. Macintoshes on Feb. 18 and 19 led to an increase in favorable expectations for the coming week.

The Mac Plus was bought and sold at $1,250 throughout the week, experiencing a major increase in volume during the second half of the week.

The most powerful of the Mac models, the Mac SE and II, held steady at $1,875 and $4,000, respectively, despite a decrease in asking prices. These two models continue to experience an increase in sales volume.

The Boston Computer Exchange can be reached at 800-BOCOEXX or 617-542-4414 in Massachusetts.

The BoCoEx Index

Closing prices report for the week ending Feb. 19, 1988

	[illegible]	[illegible]	[illegible]
IBM PC Model 076	$825	$875	$475
XT Model 086	$1,350	$1,500	$750
XT Model 089	$1,725	$1,875	$1,000
AT Model 099	$2,325	$2,400	$1,950
AT Model 339	$3,375	$3,600	$2,400
[illegible]			
Macintosh 512	$800	$900	$675
512E	$950	$1,075	$800
Plus	$1,250	$1,350	$950
SE	$1,875	$2,150	$1,700
II	$4,000	$4,200	$3,500
[illegible]			
NEC Multisynch	$500	$525	$375
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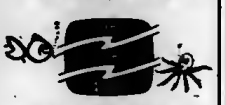
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Training Section for March

3/14 Key aspects of the information center's role in end user training.

3/28 How effective is computer-based training? What are the trade-offs between CBT and instructor-led?

Turn to the Training section of COMPUTERWORLD's March issues for an interesting editorial feature addressing these and other questions.

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'Key users' reduce expenses

BY NAOMI KARTEN
SPECIAL TO CW

Few end users are born trainers. Most possess no instructional experience. Nevertheless, it is possible to harness the enthusiasm of end users who enjoy teaching to reduce user training expenses, supplement understaffed information centers and provide an additional source of support to novices.

One way to leverage end-user enthusiasm is for organizations to designate an individual in each user department as a key end user.

Key users receive intensive training from the information center and then serve as the first source of support for departmental trouble-shooting or problem solving. Problems that stump the key user or that exceed departmental boundaries are passed to the information center for resolution.

While the information center continues to provide training on the products it supports, the key user can hold classes that are smaller, less formal and targeted at the unique needs of the department.

Program's benefits

Three of the most compelling program benefits are the following:

- Departmental end users can get more immediate support than if the information center is their closest source of assistance. End-user computing cannot contribute to productivity gains if users must wait days to get help with problems or weeks to get into a class. Local gurus can reduce this wait.
- With key users providing departmental support, the information center no longer must assist each individual user and can provide a more comprehensive service to a larger segment of the organization.
- Because they are members of user departments, key users are familiar with their departments' business functions. They can, therefore, tailor diagnostic guidelines, tips, techniques, learning aids and so on to the specific activities of their department. To be effective, a key-user program requires the right individuals, adequate information center support and management recognition of its value.

As with the information center itself, the people who can best support end users' needs in a key-user capacity are people who possess a mix of technical, training and business skills. They must be skilled at communicating technical concepts to novice users and able to get along well with people.

The information center must work with key users to ensure they understand both the functions of information center-supported products and their application to support business needs.

Key users must become familiar with policies, standards and guidelines that ensure a common approach to departmental support and training and avoid a "do it my way" orientation.

Most important, information center staff members must be readily available to help resolve problems that key users will inevitably encounter.

Many end users enjoy showing off their knowledge and will gladly give a class or demonstrate techniques to their peers. These individuals are often easy to identify. They are the ones who love to dig up solutions and are quick to help out when others get stuck.

The expertise of these individuals can be channeled in a direction that supplements formal training efforts at minimal cost.

Karten is president of Karten Associates in Randolph, Mass., and editor of "Managing End-User Computing."

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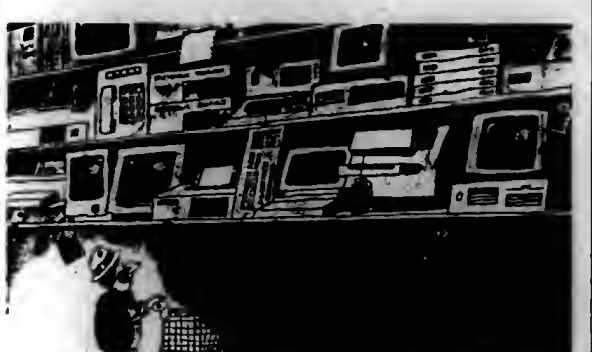
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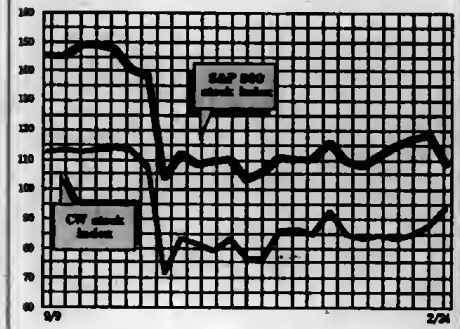
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Upcoming Computerworld Spotlight Sections

Issue Date	Topic	Ad Closing Date
March 28	Micro-to-Host-Links	March 11
April 11	PCs (IBM-Compatible) Portables/Laptops	March 28
April 25	TBA	April 8
May 9	Printers	April 22
May 23	Data Communications	May 6
June 6	CASE	May 20
June 20	The SNA Market	June 3
July 11	Disaster Prevention & Recovery Products & Services	June 24
July 25	Productivity Software	July 8
Aug. 8	TBA	July 22
Aug. 29	DB2 Market	Aug. 12

STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	89.3	92.4
Computer Systems	92.1	97.0
Software & DP Services	95.7	99.3
Semiconductors	56.8	62.2
Peripherals & Subsystems	81.0	85.1
Leasing Companies	110.3	113.3
Composite Index	82.7	87.1
S&P 500 Index	107.1	109.3













Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 24, 1988

Communications and Network Services

E		52-WEEK RANGE (1)		PRICE CLOSE FEB. 24 1988	WEEK NET CHANGE	WEEK PCT CHANGE
N	AMERICAN INFO TECHS CORP	103	74	92.63	-0.6	-0.7
Q	ANDREW CORP	16	11	14.75	-0.3	-1.7
Q	ARTEL COMM CORP	4	2	1.75	0.3	16.7
N	AT&T	30	20	29.38	0.1	0.4
Q	AVANT GARDE COMP INC	N	2	1.88	0.0	0.0
Q	AWA INTEC INC	16	6	7.25	0.4	5.3
N	AYDIN CORP	26	18	23.00	2.9	12.9
N	BELL ATLANTIC CORP	80	61	70.88	0.4	0.3
N	BELL SOUTH CORP	44	36	41.13	1.1	2.8
Q	CONCORD COMPUTER LABS INC	7	2	3.50	0.0	0.0
Q	COMPUTER NETWORK TECH	6	2	1.88	-0.1	-5.9
C	CONTEL CORP	46	23	33.75	1.0	3.1
Q	DATA SWITCH CORP	8	4	7.13	0.3	11.8
Q	DIGITAL COMM ASSOC	46	20	30.00	1.1	3.8
Q	DYNATECH CORP	43	14	20.25	0.3	1.3
Q	FIBRONICS INTERNATIONAL INC	11	2	2.75	0.3	10.0
Q	GANDALF TECHNOLOGIES	11	5	6.00	0.1	2.1
Q	GENERAL DATACOMM INDS	14	2	3.63	0.0	0.3
N	GTE CORP	45	29	38.50	0.3	1.7
Q	INFOTRON SYS CORP	28	6	7.25	0.0	0.0
N	ITT CORP	58	42	47.00	0.1	0.3
N	M A COM INC	15	7	10.38	0.9	2.8
Q	MCI COMMUNICATIONS CORP	12	6	11.25	0.4	2.9
Q	MICOM SYS INC	17	7	10.88	0.0	0.3
Q	NETWORK SYS CORP	15	7	8.38	0.3	3.7
N	NORTHERN TELECOM LTD	34	14	16.12	0.1	0.7
Q	NOVELL INC	30	12	22.25	0.3	1.1
N	NYNEX CORP	79	58	69.63	1.3	1.8
N	PACIFIC TELESIS GROUP	34	6	32.63	-0.1	-0.4
R	PARADYNE CORP	6	4	5.25	0.8	7.7
A	PENRIL CORP	5	1	3.75	0.4	11.1
N	PLESSEY PLC	41	23	26.75	2.8	13.3
N	SCIENTIFIC ATLANTA INC	20	8	13.69	1.4	11.5
N	SOUTHWESTERN BELL CORP	46	32	37.38	0.3	0.7
Q	3 COM CORP	28	12	21.88	1.8	9.1
Q	TIMEPLEX INC	41	17	32.25	0.3	0.9
Q	UNGERMANN BASS INC	16	5	12.38	0.1	1.0
N	U 2 WEST INC	80	43	59.00	1.4	2.9

Computer Systems

Q	ALLIANT COMPUTER SYS	37	5	7.25	0.3	2.9
Q	ALPHA MICROSYSTEMS	8	3	4.00	0.0	0.0
Q	ALTOS COMPUTER SYS	17	6	11.00	0.4	2.9
A	AMDAHL CORP	20	16	16.50	0.1	0.4
Q	APOLLO COMPUTER INC	25	8	16.50	2.9	20.4
N	APPLE COMPUTER INC	80	28	42.25	0.4	0.9
N	BOLT BERANEK & NEWMAN	39	12	13.88	0.8	6.7
Q	BRITTON LEE INC	6	1	1.63	0.8	16.2
N	CDC COMPUTER CORP	70	28	47.13	-0.4	-0.8
Q	COMPUTER AUTOMATION INC	17	6	12.00	1.1	9.5
A	COMPUTER CONSOLES INC	11	2	8.12	0.4	7.6
Q	CONCURRENT COMP CORP	24	11	16.00	-1.8	-7.2
N	CONTROL DATA CORP DEL	38	18	35.50	1.8	5.3
Q	CONVERGENT TECH	11	3	3.50	0.1	2.7
Q	CONVEX COMPUTER CORP	22	6	8.63	1.8	25.8
N	CRAY RESH INC	136	47	60.88	1.8	2.2
Q	DAISY SYS CORP	12	6	7.25	0.3	2.9
N	DATA GEN CORP	37	16	27.75	0.8	2.3
R	DATAPOINT CORP	6	3	4.13	0.3	0.0
N	DIGITAL EQUIP CORP	200	110	125.80	4.6	3.8
N	FLOATING POINT SYS INC	16	2	4.00	0.1	3.7
N	GOULD INC	24	8	12.25	1.8	16.7
N	HARRIS CORP	43	22	38.75	-0.1	-0.4
N	HEWLETT PACKARD CO	74	28	60.50	2.0	3.3
N	HONEYWELL INC	91	49	84.25	-0.8	-0.9
N	IBM	179	120	116.13	2.9	3.0
Q	INFORMATION INTL INC	17	6	11.25	0.3	0.0
Q	IPL SYS INC	3	1	3.00	-0.1	-5.9
Q	MASS MICROSYSTEMS	14	7	8.88	0.3	14.8
N	MATSUSHITA ELEC INDL LTD	138	39	179.63	2.1	1.2
Q	MEGADATA CORP	6	3	3.88	0.0	0.0
Q	MENTOR GRAPHICS CORP	28	14	27.38	2.9	14.1
N	MOT INC	14	4	8.25	1.1	27.9
N	NCR CORP	87	50	84.38	2.1	2.9
N	PRIME COMPUTER INC	21	12	17.88	0.1	0.7
Q	PYRAMID TECHNOLOGY	12	6	7.75	0.0	0.0
Q	STRATUS COMPUTER	41	16	27.00	3.0	12.5
N	SUN MICROSYSTEM INC	46	14	26.00	2.0	8.1
Q	SYMBOLICS INC	6	1	1.50	0.1	4.3
N	TANDEM COMPUTERS INC	38	17	21.63	0.1	16.3
N	TANDY CORP	57	28	38.38	0.4	1.0
N	ULTIMATE CORP	37	15	15.12	-0.8	-4.9
N	UNISYS CORP	46	24	36.00	1.8	4.3
A	WANG LABS INC	19	10	14.12	-0.3	-1.7

Software & DP Services

Q	ADVANCED COMP TECH	6	1	1.63	0.1	6.3
N	AGS COMPUTERS INC	30	11	15.25	0.3	1.7
Q	AMERICAN MGMT SYS INC	20	6	18.00	1.8	7.8
Q	AMERICAN SOFTWARE INC	22	10	11.63	1.8	17.7
N	ANACOMP INC	11	4	7.88	0.3	3.3
Q	ANALYSTS INTL CORP	16	4	7.00	0.3	0.7
Q	ASHTON TATE	33	12	27.38	2.9	10.8
Q	ASK COMPUTER SYS INC	17	8	12.13	0.3	2.4
Q	AUTODESK INC	24	12	22.25	2.9	15.0
N	AUTO DATA PROCESSING	38	16	43.00	-0.8	-1.7
Q	BOOLE & BABBAGE INC	12	6	7.75	0.0	0.0
N	COMPUTER ASSOC INTL INC	37	19	28.63	-0.8	-0.8
Q	COMPUTER HORIZONS CORP	16	7	8.63	0.4	4.1
N	COMPUTER SCIENCES CORP	73	65	82.00	1.8	2.0
R	COMPUTER TASK GROUP INC	17	6	9.88	0.4	3.9
Q	COMPUWARE INC	28	12	16.75	-0.8	-1.9
R	CULLINET SOFTWARE INC	14	4	8.38	0.3	4.1
Q	CYCARE SYS INC	10	6	7.88	0.0	0.0
Q	DATAMEDIX SYS INC	30	10	20.50	0.8	2.8
A	DATA ARCHITECTS INC	17	7	13.50	4.0	42.1
N	GENERAL MTRS (CL E)	61	30	38.75	2.9	7.9
Q	HOGAN SYS INC	17	6	8.12	0.3	12.9
Q	INFORMIX CORP	31	12	25.50	0.3	2.7
Q	INTELLICORP INC	11	3	3.00	0.3	9.1
Q	IXIANE INC	10	6	7.00	-0.8	-8.7
Q	LOTUS DEV CORP	40	16	30.38	1.0	2.9
Q	MANAGEMENT SCI AMER	30	6	6.38	0.3	4.1
Q	MICRO PRO INTL CORP	6	2	3.50	0.3	8.1
Q	MICROSOFT CORP	79	37	58.88	2.4	4.1
Q	MORINO ASSOCIATES INC	24	7	17	0.3	1.8
Q	NATIONAL DATA CORP	28	19	20.50	0.3	1.2
Q	ON LINE SOFTWARE INTL INC	22	9	11.38	1.8	18.7
Q	ORACLE SYS CORP	15	6	15.50	0.3	2.1
R	RANSOMIC SYS INC	29	11	15.88	-0.3	-1.9
Q	ROLICY MGMT SYS CORP	28	15	22.25	0.3	1.2
Q	ROBINMAKING 4 SYS INC	14	7	11.50	0.3	2.3
Q	REYNOLDS & REYNOLDS CO	39	14	32.50	2.9	15.5
Q	SEI CORP	18	10	13.00	0.3	2.4
Q	SHARED MED SYS CORP	28	18	26.63	0.3	1.2
Q	SOFTWARE AG SYSTEMS INC	18	7	11.50	2.9	21.4
Q	SOFTWARE PUBS CORP	17	6	12.50	2.9	23.5
A	STERLING SOFTWARE INC	14	6	8.38	0.1	1.2
Q	SUNGUARD DATA SYS INC	21	10	16.25	0.3	2.2
Q	SY-TEMATICS INC	33	19	38.00	-2.0	-4.7
R	SY SOFT INC	24	7	18	1.8	8.7
Q	VM SOFTWARE INC	46	7	12.28	0.8	0.3

Semiconductors

N	ADV MICRO DEVICES INC	26	N	12.25	1.8	18.3
N	ANALOG DEVICES INC	24	6	13.13	1.8	15.4
Q	ANALOGIC CORP	12	N	6.88	0.0	0.3
Q	INTEL CORP	63	16	28.50	2.9	10.7
Q	LSI LOGIC CORP	17	7	9.25	0.8	9.3
N	MOTOROLA INC	74	36	47.13	2.5	5.3
N	RATL SEMICONDUCTOR	22	11	11.25	0.8	8.3
N	TEXAS INSTRS INC	80	36	48.25	2.9	7.5
A	WESTERN DIGITAL CORP	36	11	14.88	2.5	20.2

Peripherals

Q	ALLOY COMP.	13	3	3.38	-0.1	-3.6
N	AM INTL INC	5	3	4.00	0.3	8.7
Q	ARI RESH INC	28	6	8.13	0.0	0.0
Q	AUTO TROL TECH CORP	N	2	3.94	0.0	0.3
Q	BARCTEC INC	16	N	6.75	0.1	1.5
Q	CIPHER DATA PRODS INC	18	4	7.25	0.3	3.6
A	COMNITRONICS CORP	6	2	2.75	0.1	4.3
N	COMPUGRAPHIC CORP	26	18	22.38	-1.1	-4.8
N	COMPUTERVISION CORP	22	7	7.00	0.0	0.3
A	DATAPRODUCTS CORP	24	7	8.38	0.0	0.0
A	DATARAM CORP	8	5	8.00	0.0	0.3
N	DECISION INDS CORP	13	4	10.63	0.0	0.0
N	EASTMAN KODAK CO	71	46	41.25	-1.1	-2.6
Q	E M C CORP MASS	26	10	13.00	0.0	0.0
Q	EMULEX CORP	8	4	7.63	1.0	15.1
Q	EVANS & SUTHERLAND	45	18	20.25	-0.8	-3.6
Q	ICOT CORP	12	3	4.75	1.0	26.7
Q	INTERLEAF INC	24	N	16.63	1.0	6.7
Q	IOMEGA CORP	6	1	1.50	0.3	6.1
Q	LEE DATA CORP	6	3	3.75	0.3	7.1
Q	MASSTOR SYS CORP	6	1	1.88	0.1	7.1
Q	MAXTOR CORP	22	6	13.00	1.8	15.6
Q	MICROPOLIS CORP	44	13	24.00	1.8	7.8
Q	MINISCRIBE CORP	18	6	8.00	0.8	4.3
N	MINNESOTA MNG & MFG CO	94	46	58.00	-0.6	-1.0
A	MSI DATA CORP	24	12	24.38	2.9	10.8
Q	PRIAM CORP	6	1	2.13	0.0	20.8
Q	PRINTRONIX INC	12	7	8.63	-0.1	-1.4
N	QMS INC	27	8	8.60	0.3	2.7
Q	QUANTUM CORP	26	8	10.75	0.0	0.0
Q	WANGTEK INC	N	2	3.88	-0.1	-3.1
N	RECOGNITION EQUIP INC	24	7	8.13	-0.1	-1.4
Q	REXON INC	14	6	7.00	0.3	6.7
Q	SCAN TRON CORP	14	7	10.25	0.0	0.3
Q	SEAGATE TECHNOLOGY	46	10	18.00	2.9	13.4
N	STORAGE TECH CORP	N	1	2.00	0.1	6.7
Q	TANDON CORP	7	1	1.78	0.2	12.0
Q	TEC INC	7	3	4.81	-0.3	-6.1
N	TEKTRONIX INC	41	21	25.25	0.3	1.1
Q	TELEVIDEO SYS INC	2	1	1.31	0.0	0.3
N	TELEX CORP	102	28	30.00	1.8	2.9
Q	WYSE TECH	46	11	20.25	2.9	13.2
N	XEROX CORP	26	20	58.63	-0.8	-0.4
Q	XIDEX CORP	16	6	6.75	-0.1	-1.8

Leasing Companies

Q	CAPITAL ASSOCIATES INTERNATIONAL INC	11	4	5.00	0.1	2.9
N	COMDISCO INC	37	12	20.50	0.8	4.5
N	CONTINENTAL INFO SYS	14	6	7.50	0.3	7.1
Q	PHOENIX AMERN INC	7	2	2.75	-0.1	-4.3
Q	SELECTERM INC	6	3	4.12	0.1	2.1

EXCH: N—NEW YORK; A—AMERICAN; O—NATIONAL; O—OVER-THE-COUNTER; S—SPLIT

Q-T-C PRICES ARE BID PRICES AS OF 2 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Springboard

Gainers prevail as mini-bull market launches most stocks

Computer issues took their cue last week from a market in which the Dow Jones Industrial Average reached its highest level in more than six weeks to register generally steady advances in trading.

Top gainers as of Thursday's close included Digital Equipment Corp., whose strong gains on Monday helped maintain its steady climb to 123¾, up 3 points from the week earlier; Stratus Computer Corp., up 3 points to 27¼; and Ashton-Tate Corp., where positive reaction to its Dbase upgrade helped the stock rise 2¾ points to 27⅜.

More modest gainers included Seagate Technology, up 1½ points to 18¼; Compaq Computer Corp., which rose 1⅜ points to 48¼ after being added to Standard & Poor's 500 stock index; Tandem Computers, Inc., up 1⅜ points to 20¼; Apollo Computer, Inc., which rose 1⅜ points to 15⅜; Advanced Micro Devices, Inc., up 1⅜ to 12; and IBM, up 1¼ points to 114½.

Slight losses, however, reached Control Data Corp., down ⅜ of a point to 24⅜; Hewlett-Packard Co., which slid ¼ of a point to 60; and Microsoft Corp., down ⅜ of a point to 58⅛.

JAMES DALY

AI tools cast in production role

IBM mainframe tool merges knowledge base processing, data base access

BY NELL MARGOLIS
CW STAFF

WALTHAM, Mass. — Alcorp, Inc. last week announced an IBM mainframe-based expert systems builder that it said integrates knowledge base processing with existing corporate data bases for use in large-scale production applications.

Knowledge Base Management System (KBMS) can be accessed by modifying existing mainframe applications to supply a user with embedded rules-based expertise, said Alcorp President Robert N. Goldman. An expert system built with the product reportedly can also function as a stand-alone application capable of accessing IBM's DB2 and SQL/DS relational data bases. In addition, a user may define paths to other mainframe data base management systems through a customizable exit facility.

KBMS is the only mainframe-based expert systems tool to incorporate all four of the reasoning methods currently at work in expert systems technology, according to Alcorp founder and Chairman Larry Harris. Alcorp was formerly known as Artificial Intelligence Corp.

Drawing on these methodologies, Harris said, KBMS can interpolate information from the corporate data base with rules and facts stored in KBMS-created knowledge bases to address what one early KBMS user called "the ambiguous kind of problems that make up most of the action out here in the real business world."

In fact, the product originated in that "real business world." It was co-developed with and tested by several Alcorp customers, each of which has already put the system to work in production applications. Liberty Mutual Insurance Co. and Transamerica Insurance Group, for example, are both using KBMS in underwriting. Southern California Edison Co. developed a KBMS-based application for weather and temperature forecasting.

Needs space

Written in the C language, KBMS occupies its own IBM MVS address space in a manner similar to a data base manager, Goldman said. It is not tied to a particular teleprocessing monitor.

KBMS can be accessed by a terminal called from within an application program. AI/SQL, a proprietary Alcorp SQL-like language, can be used to manipulate data and rules in order to come up with an answer needed by the application.

The system, Harris said, gains production application power from an internal network that does for rules what an index does for data base files. When any change occurs, the network allows only those rules that are affected to be triggered. That limits the resource-intensive process of scanning rules serially looking for a hit.

KBMS's application interface was designed by Tom Nelson, formerly with Cullinet Software, Inc., who designed the central architecture of Cullinet's IDMS DBMS.

Southern California Edison, one of the country's largest electric utility companies, is among the four companies constituting Alcorp's KBMS consortium of early users and development consultants.

The system was applied to a load-forecasting application that predicts electricity demand, according to Michael Mushet, manager of technology research for the information services department at Southern California Edison.

"If our estimates are off on the low side, we're failing our customers; if they're too high, we're left with an extremely expensive inventory," Mushet said.

The company's KBMS model for predicting weather temperatures, Mushet said, is bettering the National Weather Service's predictions and coming within half a degree of the human weather expert it emulates.

Slated for commercial availability in June, KBMS supports IBM mainframe environments, including MVS/XA, MVS and VM operating systems; CICS, TSO, IMS/DC and CMS teleprocessing monitors; and DB2, SQL/DS and other DBMSs.

Prices will range from $90,000 to $200,000, depending on options selected and data bases interfaced, the vendor said.

VM/IS users: Installing is easy, nothing else is

BY ROSEMARY HAMILTON
CW STAFF

VM/IS, the mainframe operating system positioned by IBM as being easy to use, does meet its claims of easy installation; but living with it is another story entirely, several early users said last week.

VM/IS, users claimed, requires a fundamental knowledge of the mainframe operating system on which it is based and senior-level programming skills to maintain it.

The users, all of whom have technical backgrounds, said they are generally satisfied with the operating system but raised doubts as to whether a nontechnical user could manage it. "You don't need an MIS staff, but you do need a pretty sharp technical mind," said Ronald Koontz, director of MIS at JLG Industries, Inc.

Users noted that the real challenge to VM/IS comes when users move beyond simple operations or when they go out of the VM/IS environment by installing a third-party software product. "When you get into packages like [Must Software International's] Nomad2, you cross the threshold and need a real systems programmer to help," said Joe D'Amico, director of applications development at the Federal Asset Disposition Association in San Francisco.

IBM has positioned VM/IS as an operating system for departmental end users that can be managed by a systems administrator with a lower skill level than an experienced MIS staffer.

It has been tailored to provide easier installation and maintenance. In addition, there are nearly 30 program products, such as IBM's SQL/DS and Professional Office System, that users can select to be rolled into the VM/IS environment. In effect, customers can order a ready-made data center.

Usage on light side

Forrester Research, Inc. in Cambridge, Mass., estimated that 20% to 30% of IBM 9370s shipped are running VM/IS. Estimates of 9370 shipments vary from 3,000 to 4,000.

"IBM has been trying to position it as a departmental system, but they just aren't there yet," said Robert Kusche, president of VM/Assist, a consulting firm in San Francisco that recently completed four VM/IS installations for clients. "VM/IS is a real pretty shell around existing products. The problem is, IBM didn't make the existing products easier."

Mark Douglas, a software engineer who works on a consulting basis for Phoenix Reinsurance Co. in New York, said he defines VM/IS as the same as VM but with a very good installation guide. "VM/IS is what should be shipped with VM anyway," Douglas said.

An IBM spokeswoman said she could not respond to users' claims on VM/IS without more knowledge of each user's specific environment. She said IBM does not use a strict definition for the term "systems administrator" but said IBM's reference to a systems administrator in the VM/IS announcement letter of October 1986 was a person who "did not require the skills of a programmer or DP expert."

However, it would not be possible to run a VM/IS environment without programming skills, especially if you "move beyond the prepackaged realm," said Tony Rodgers, operations manager at the Federal Asset Disposition Association.

"We did considerable tailoring to our [VM/IS] environment that would have posed problems to a systems administrator without much DP experience," added James Binger, a systems programmer for the Milwaukee County government.

One site recently installed Oracle Corp.'s data base management system, and another site has been running Must Software's Nomad2 on a 9370 under VM/IS. In both cases, users reported that the installation and maintenance of the software is the same as in a typical VM mainframe environment.

According to Allan Christenson, manager of technical support services for the Milwaukee County government, "If you advance to things like VTAM that are complex, you need a systems programmer with communication experience."

Users contacted last week said they provide their own support, although IBM does provide a remote support facility for VM/IS and has placed emphasis on remote service from a host environment. The company has been announcing products that would allow users at a central site to support a 9370 remote installation.

New MVS

FROM PAGE 1

replace four to seven logic boards in the NAS AS/XL and AS/VL processors to run MVS/ESA.

An Amdahl spokesman said the only delays he anticipates in supporting MVS/ESA involve customers who want to compare the existing Amdahl Multiple Domain Facility (MDF) with IBM's new Processor Resource/Systems Manager for IBM 3090E models.

The spokesman said MDF and other features comparable to those in MVS/ESA are already offered or can be easily added to Amdahl's 580 series mainframes. In comparing the transition to MVS/ESA with the migration to IBM's MVS/XA in 1981, he said the MVS/ESA transition should be about half as difficult.

PCMs denied that IBM's introduction will stall user purchases of mainframes. However, analyst Robert Tasker of Boston-based market research firm The Yankee Group said he has already advised one client, an insurance company ready to write a check for an Amdahl mainframe, to wait.

"If you are in that high-end game, you can't afford not to at least pay attention to an operating system from IBM," Tasker said.

PCMs and industry watchers last week provided an unusual look at how hardware manufacturers construct compatible systems, based largely on public documents.

"What we do is read the book, the customer operations manual," said one industry executive who asked to remain anonymous. "Between 95% and 99% of what you need to know is in it. Anybody can buy the book for $14."

Dennis Stein, manager of processor systems marketing at Amdahl, said PCMs and other companies learn about product plans by monitoring each other's patent filings.

NAS's Claunch noted that IBM patents for the multiple data spaces featured in MVS/ESA were first patented around 1980. But, he added, IBM did not have a method to allow user applications to take advantage of them. Claunch said subsequent patents provided more of an indication of direction for features, such as IBM's expanded storage.

Observers said that PCMs next examine product specifications, which are published within 120 days of an announcement in the IBM Principles and Operations Manual. Then they buy the IBM product and study the software documentation.

The software license specifically permits use of software to design compatible hardware, observers said. Final compatibility tests are accomplished by running particular instructions and monitoring the machine parts, such as registers, to see how they react.

One executive noted that the original PCM machines introduced in the mid-1970s were designed by technicians who took machines apart and analyzed the components with oscilloscopes. He said large-scale integration produces components that are too small to attach to instrument contacts.

Amdahl's Stein said, "In 15 years, we've gone through this so many times that it's second nature."

EDS

FROM PAGE 1

$4.38 billion in revenue.

But behind those impressive growth figures, EDS's relationship with the auto giant was hitting some serious potholes. Analysts were questioning whether GM would truly become leaner and meaner after spending billions of dollars on factory automation and systems integration. Several individual projects fell behind schedule. And there were complaints and unrest among the 7,500 former GM MIS managers who had become part of EDS.

"I think the working relationship between EDS people and



EDS's Hank Johnston

GM is outstanding now, knowing that as recently as a year to 18 months ago, it was a pretty traumatic experience," Atwood says.

Former GM employees have reportedly adapted to EDS's management style and working environment. And perhaps most important, EDS has completed the two projects that attracted GM to acquire the company in the first place: the consolidation of the auto company's 110 disparate networks into a single, worldwide telecommunications system; and the amalgamation of 50-odd GM data centers into 19 information processing centers.

Now that EDS has passed the initial crunch period of GM projects, GM is encouraging the company to "take the capabilities they've learned [at GM] and move out into the world to enhance their own sales," Atwood says. But before it can compete effectively, EDS must do some groundwork to match its own capabilities and market image to customers' integration needs.

"I think it's a matter of education," says Hank Johnston, vice-president of sales and marketing for EDS's North American Commercial Group. "Most people in the marketplace look at us as a total computing and automation provider and think this is the only way we will solve their problems." EDS is trying to back off from its former "all-or-nothing" image in systems integration, he adds.

Changing the angle

"EDS still wants to become pervasive in a company, but now it is [moving toward that goal] from different angles," says William Shattuck, a software and services analyst for Montgomery Securities. "They'll try to get their foot in the door with bite-size projects to show what they can do; then, once they get to know the customer, they'll come up with broader projects."

EDS is now trying to demonstrate its willingness to "participate in all or part [of a systems integration project] as long as we get a chance to work with the customer over that time period," Johnston says.

One such customer is Eastman Kodak Co., which recently hired EDS to help it determine a cost-effective strategy for networking its multivendor systems worldwide [CW, Feb. 22]. A survey of corporate users, jointly performed with EDS, helped Kodak decide to migrate to the ISO's Open Systems Interconnect standard.

Alan Chase, Kodak's group manager of research and network engineering, says he was impressed with EDS's ability to "mobilize and, boom, do a project. A lot of the company's success is due to its energy, enthusiasm and its ability to seize the moment and strike fast." EDS's GM background was another major reason why Kodak hired the company, Chase says.

Nevertheless, Kodak plans to keep an open mind when it selects vendors to help it choose and implement the components of its new telecommunications network. The initial spadework that EDS performed "was very much a distinct project that could lead to other projects — for EDS or for other vendors," Chase says noncommittally. But that is the type of attitude EDS would like to change.

"We're trying to get people to focus on the larger picture, how concepts like just-in-time delivery and electronic data interchange can make them more effective competitively in the marketplace," Johnston says.

Spearheading EDS's efforts in that direction is the North American Commercial Group, formed in mid-1986. Johnston says the mandate of this smallest but fastest growing EDS division is to provide integration services in the manufacturing, retailing and distribution, utilities, travel and transportation sectors.

Networking integration is another focus for EDS's drive for new business. Late in 1986, EDS formed EDS Communications Corp., a subsidiary that offers to help organizations identify and solve their networking needs.

Bullish

Many analysts are bullish about EDS's prospects of dominating the commercial systems integration field — a market that will grow from $1 billion in 1987 to $5 billion in 1992, according to Input, a Mountain View, Calif., consulting firm. Those figures do not include ongoing facilities management services or products provided for systems integration projects by a vendor not directly involved as a contractor, Input says.

"The whole systems integration business is changing in character, offering more market opportunities as corporations need more help in tackling new, more complex strategic applications and integrating corporatewide networks," Shattuck says.

Of course, that expertise is also being developed by EDS's leading competitors, including Boeing Computer Services, Martin Marietta Corp. and IBM's Federal Systems Division. IBM reportedly pulled in $1.5 billion in commercial systems integration revenue last year. EDS's systems integration revenue totaled $1.4 billion, excluding its GM business; it was $4.3 billion with GM-related revenue included (see chart above).

Company representatives are vague about the number and nature of signed or pending commercial systems integration contracts. However, Johnston mentions "a number of things pending . . . sizable things we're looking at, including some major computer-integrated manufacturing opportunities." EDS performed "eight or 10 consulting projects or major studies, some of which will lead to something in 1988," he adds.

Changing lanes

GM's contribution to EDS's revenue stream is shrinking



INFORMATION PROVIDED BY ELECTRONIC DATA SYSTEMS CORP.
CW CHART

No firm is an island

Even a $4.6 billion-a-year company like Electronic Data Systems Corp. (EDS) knows it cannot do everything by itself. The company is increasingly striking deals, with varying degrees of success, with other contractors.

This is standard procedure in the government systems integration market, in which a typical contract involves one or more prime contractors and some 60 or 70 subcontractors. However, EDS's relationships in this area have gone through some rough times of late. Last month, the company split up with U.S. Sprint Communications Co., its bidding partner in a multibillion-dollar telecommunications contract for the U.S. General Services Administration.

Friction is common in the federal systems integration arena, particularly when two dominant, strong-willed partners are involved in a contract, says Thomas Nolle, president of Haddonfield, N.J., consulting firm CIMI Corp. "And yet, with the scope of what the government is trying to do, it's hard to find just one company for the job," he adds.

EDS may have better luck in the manufacturing market, in which it has formed two major alliances: one with Tandem Computers, Inc. and one with a fellow General Motors Corp. subsidiary, GM Hughes Electronics. In November 1987, EDS and Tandem entered an agreement in principle to jointly develop and market products and services to help manufacturers connect and functionally integrate multivendor business, engineering and factory control systems.

The two partners are going after Digital Equipment Corp. in the manufacturing network integration field, with Tandem providing the shop floor hardware and host networking products, and EDS tying it all together, according to Anthony Friscia, president of Advanced Manufacturing Research, Inc. in Salem, Mass. EDS is currently seeking other alliances of this type, he adds.

Hughes and EDS have worked together on several GM projects, including the design and implementation of computer-integrated manufacturing systems at several GM plants, according to GM Vice-Chairman Donald Atwood. Recently, the two subsidiaries began offering their joint services to outside businesses; they reportedly are in the talking stage with several companies. In addition to its shop floor expertise, Hughes brings to the table an extensive line of satellite-based products and services.

ELISABETH HORWITT

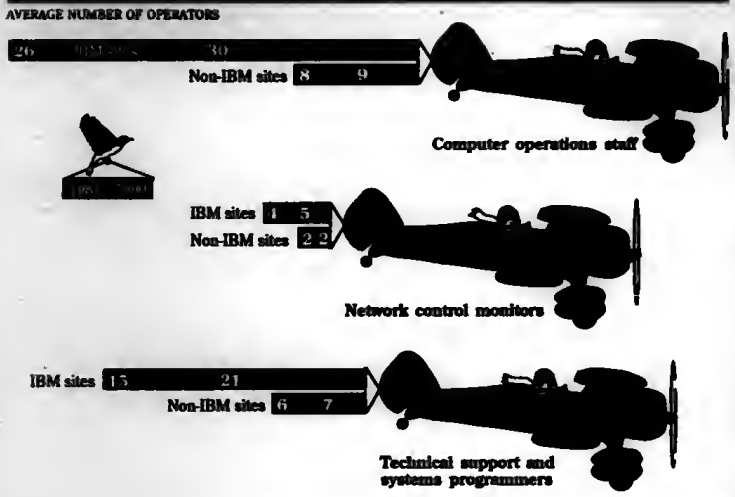
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TRENDS

Data center staffing

Tools put drag on data center staff growth



Along with moderate growth in numbers, data center staffing will be marked by the redeployment of some personnel in the next three years, a recent study said.

There will be relatively strong growth in the numbers of technical support and systems programming personnel through 1990, and some data center workers will be shifted to network management, according to a survey of 101 major computer installations by International Data Corp.

A key factor in overall data center staffing will be automated tools. Consistently, the companies that projected no change in their use of automated tools anticipated relatively large increases in staffing.

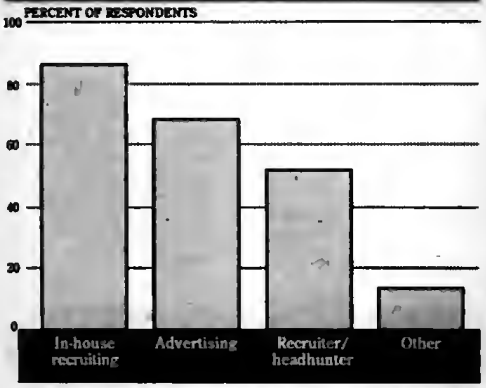
Companies projecting increased use of tools project more moderate growth in staff, and some firms anticipating much greater use of the tools project decreases in staffing.

With the growing complexity of networks, firms expect to employ more network monitors. While network management is becoming a data center function at some companies, many are still grappling with how to handle the growing field, the study found.

When it comes to recruiting, the surveyed companies expressed a preference for in-house job posting, an inexpensive approach often required by corporate policy.

DAVID A. LUDLUM

Job posting tops hiring techniques



Companies are flexible with training



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHARTS: AMY J. SWANSON

INSIDE LINES

Don't fly with us. At last week's Personal Computing Forum in Naples, Fla., Esther Dyson's annual superstars' romp in the sun, Mark Teflian had some strong words for IBM. Teflian, vice-president of technology planning for Covia, United Airlines' information services subsidiary, said he wouldn't be much inclined to buy many more IBM PS/2s unless the company granted licenses for its Micro Channel architecture. Teflian's firm has some 69,000 workstations, many of which are PS/2s.

Moving on down. IBM will announce a Micro Channel-based version of its low-end PS/2 Model 30 as well as speedier disk drives for its Model 50 in early April, sources said last week; however, it isn't clear whether the Model 30 will contain Intel's 8086 or 80286 processor. IBM is also planning a splashy promotion for its dealers in the next few weeks involving OS/2 and the PS/2 Model 80; according to one source, the company has met only 50% of its internal sales goal for the Model 80.

One who fell off the Apple tree. Next, Inc., Steve Jobs' start-up, plans to unveil its long-awaited workstation next month, and the word is it's a screamer. Sources say the Motorola 68030-based system is faster than a speeding bullet and that its on-screen resolution equals that of its output — something not yet achieved. The company won't restrict sales to the academic market, as it initially said, and will push it hard in the commercial market, sources said.

Super achievers? Apollo plans to announce tomorrow a workstation in the class of the personal supercomputers expected from Ardent and Stellar. The workstation reportedly will run Domain, Apollo's version of Unix that supports both the University of California at Berkeley's Unix 4.3 and AT&T's System V. Scheduled to be offered at a price of less than $100,000, the system will be software code-compatible with current Apollo products, with some compiling necessary, according to a source close to the company. In addition, Ardent is expected to announce its workstation tomorrow. Stellar is slated to make its announcement March 14.

A shot across the bow. A small third-party maintenance firm has won the first battle of its legal war charging Hewlett-Packard with unfair business practices. Cleveland-based Hypoint Technology won a preliminary injunction last week requiring HP to reinstate the availability of four-hour service response time to HP customers who also use Hypoint's maintenance services; HP rescinded the service policy last August. Hypoint's attorney called the ruling the first victory by an independent service firm against a major vendor.

View inside DEC. Word is that DEC will soon, at long last, release Decview. This is consultants' latest nickname for the integrated, "open," centralized network management architecture that will be DEC's answer to IBM's Netview. The latest rumor is that DEC is basing the product on Cincom Systems' Netmaster, which has already gained a substantial user following as a more flexible, functional alternative to Netview.

No, yes and yes. Apple officials spent much time last week denying published reports that the company will introduce a laptop version of the Macintosh later this year. Sources close to the company said the Mac laptop has been hampered by Apple's inability to produce one cheaply enough to compete in that price-sensitive market. Meanwhile, sources close to the company said Apple will announce this week a compact disk/read-only memory disk drive designed to plug into its Macintosh and Apple II computers. Priced at $1,200, the CD SC product reportedly will be bundled with a compact disk featuring reference sources. Finally, Apple and Texas Instruments are said to be ready to announce Thursday a joint project to build an artificial intelligence workstation.

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